GR3770

TECHNICAL MANUAL

VERSION 1.0
AUGUST, 1997

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CONTENTS

1. MACHINE SUMMARY

1. Preface 1-1
   CAUTION 1-2
   WARNING 1-3
   NOTICE 1-4
2. Features of the Risograph GR3770 1-5
3. Specifications 1-6
4. Product Compatibility 1-7

2. DRUM SECTION

[Theory of Operation]

1. Drum Insertion Error Preventive System 2-1
2 Ink Bottle Detecting System 2-2
3. Ink Supply System 2-3

[Removal]

1. Ink Bottle Set SW Assy. 2-4

3. FLAT BED IMAGE SCANNING SECTION

[Theory of Operation]

1. Scanner Table Setting System 3-1
2. Stop Position of Image Scanner 3-2
3. Image Scanner Position Detecting System 3-3
4. Flat Bed Original Set Confirming System 3-6
5. Flat Bed Auto Scanning Contrast Adjustment System 3-7
6. Flat Bed Image Scanning System 3-8

[Removal]

1. Stage Glass 3-10
2. Image Scanner Unit 3-11
3. Flat Bed Original Detection Sensor and Image Flexible Wire 3-12
4. Flat Bed Read Pulse Motor Unit 3-13
5. Original Stopper and Shading Glass 3-14

4. MASTER MAKING SECTION

[Removal]

1. Thermal Print Head 4-1

[Adjustment]

1. Thermal Power of Thermal Print Head 4-3

5. MASTER CLAMP & LOADING SECTION

[Theory of Operation]

1. Clamp Unit Home Positioning System 5-1
2. Clamp Plate Master Release System 5-2
3. Clamp Plate Master Clamp System 5-4

[Removal]
1. Clamp Unit 5-6
2. Disassembling of Clamp Unit 5-7
3. Angle Sensor Ass'y. 5-8

APPENDIX (I)

[TEST MODE]
1. Operation Procedures ..... APX(I)-1
2. Testing Sensor and Switch ..... APX(I)-3
3. Testing Motor and Solenoid ..... APX(I)-4
4. Memory Switch ..... APX(I)-5
5. Memory Clear and Counter Stop, etc. ..... APX(I)-7
6. Sequential Operation Test ..... APX(I)-8
7. Panel Test ..... APX(I)-10

[ADVICE DISPLAYS]
1. Trouble Messages (T Display) ..... APX(I)-11
2. Trouble Messages (Others) ..... APX(I)-15
3. Setting Confirmation Messages ..... APX(I)-18
4. Change-of-Consumables Messages ..... APX(I)-19

APPENDIX (II) DESCRIPTION OF PCB'S

1. Block chart ..... APX(II)-1
2. Location of PCBs ..... APX(II)-2
3. SYSTEM PCB2 ..... APX(II)-3
4. Image Processing PCB (IPIF) ..... APX(II)-10
5. Motor Control PCB MK2 ..... APX(II)-13
6. Drum Control PCB3 ..... APX(II)-15
7. ADF PCB ..... APX(II)-17
8. FBI PCB ..... APX(II)-19
9. Option PCB AIII ..... APX(II)-22
10. LCD Control PCB ..... APX(II)-24
11. Power Supply PCB 100-120V ..... APX(II)-26
12. Power Supply PCB 200-240V ..... APX(II)-28
13. TPH Sub PCB ..... APX(II)-31

1. MACHINE SUMMARY

CONTENTS

1. Preface 1-1
   CAUTION 1-2
   WARNING 1-3
   NOTICE 1-4
2. Features of the Risograph GR 3770 1-5
3. Specifications 1-6
4. Product Compatibility 1-7

1. PREFACE

This manual provides Technical Service Information for the RISOGRAPH **GR 3770** duplicator. You are advised to use this together with "RA Series" "GR Series" Technical Manual as this "GR 3770" Technical Manual includes only the items different from the other GR Series machines.

This manual is published as a reference guide for use by RISO Group (RISO Kagaku Corp./RISO, INC./RISO EUROPE Ltd.) Certified Technical Representatives experienced in duplicator repair and service.

This manual also provides procedures for removing and installing major components. Following these procedures will minimize machine malfunctions. This information and format will also increase technical representatives' awareness and experience regarding repairs necessary to insure end-user satisfacion.

If assistance is required, please contact one of the following: _____

[RISO Kagaku Corp.]
Overseas Technical Section, Overseas Technical Dept.
2-5-1, Akanehama, Narashino-shi, Chiba 275, JAPAN
TEL: (0474) 52-4111 FAX: (0474) 52-3106 TELEX: 252-2298RISO J

[RISO EUROPE LTD.]
1230 High Road, Whetstone, London N20 0LH, United Kingdom
TEL: (81) 446-1188 FAX: (81) 446-9547

[RISO, INC.]
NOTE: Before attempting to correct machine malfunctions, study the Technical Manual and make sure all questions and/or concerns have been satisfied. If necessary, please use the Technical Hotline:

TECHNICAL HOTLINE

800-578-7476
(Emergency Technical Assistance Only!!!)

REFERENCE	ADDRESSES	FOR
A	RISO, INC. Tech. Support Center 310 Andover Street Danvers, MA 01923	Technical Support Operations Correspondence and Technical Training
B	RISO, INC. REPAIR DEPT. 310 Andover Street Danvers, MA 01923	Repairs and Warranty Claims

CAUTION

[Handling of Lithium Battery]

- **Never fail to follow the following instructions when you discard the used lithium battery.**

1. Never let the battery short-circuited.

If the (+) and (–) terminals contact each other or metal materials, the battery will be short-circuited. If the batteries are collected and stored inorderly or one upon another, the above-mentioned case will occur.

-DANGER-

If the battery is short-circuited, it will heat up and may in some cases explode into fire.

2. Never heat up the battery.

-DANGER-

If you heat the battery up to more than 100°C or put it into the fire, it may burn dangerously or explode.

3. Never disassemble the battery or press it into deformation.

-DANGER-

If you disassemble the battery, the gas pouring out of the inside may hurt your throat or the negative lithium may heat up into fire.

If the battery is pressed into deformation, the liquid inside may leak out of the sealed part or the battery may be short-circuited inside an explode.

4. Never fail to keep the battery out of reach of children.

If you put the battery within reach of children, they may swallow it down.

Should they swallow the battery, immediately consult the doctor.

[Replacement of the Lithium Battery]

1. **The lithium battery must be replaced by a trained and authorized service technician.**
2. **The battery must be replaced only with the same or equivalent type recommended by the manufacturer.**
3. **Discard used batteries according to the manufacturer's instructions.**

!! WARNING !!

Important Safety Precautions

1. Always disconnect electrical supply before placing hands in the machine.

1. **To avoid injuries:**
   Be sure to disconnect the electrical power before disassembling, assembling, or when making adjustments on the machine.

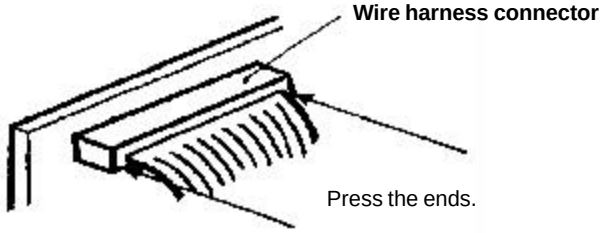
2. **Protection of the machine:**
   Make sure to turn OFF the power to the machine before plugging or unplugging the electrical connectors, or when connecting a Meter.

2. Always connect electrical connectors firmly.

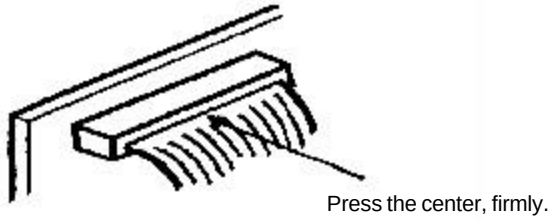
1. **To avoid electrical failure:**
   The connectors must be connected firmly together and onto the PCBs.
   Press on the ends of the connectors and then on the middle to ensure a firm fit.

2. **Protection of the electrical components:**
   The electrical components may be damaged due to short circuits caused by a loose connector.

FIRST



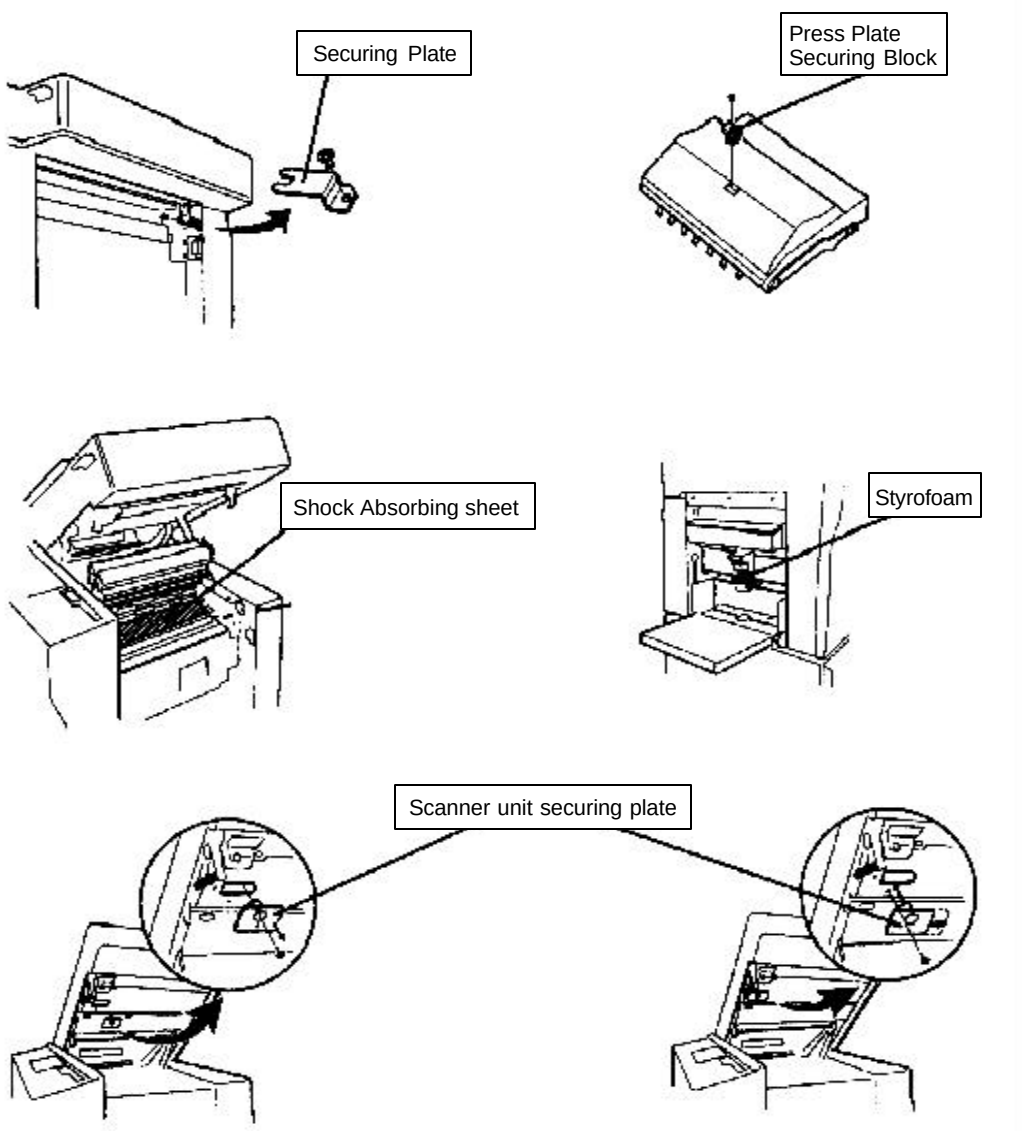
THEN



NOTICE

Please be sure to follow the procedures as below in installation :

1 Remove the parts in 5 places as shown in the figures below.
2 Activate the Test mode.
3 Enter No.133 to release the electrical lock.



(1) Remove the securing screw on the Scanner Unit Securing Plate to release the lock.

(2) Place the Scanner Unit Securing Plate into the left end of the hole, then secure it again.

Caution

Do not turn the power ON with Scanner Unit Securing Plate left unremoved, which may damage the machine.

2. FEATURES OF THE RISOGRAPH GR3770

This chapter mainly describes technical features. As for advantages concerning business operation, see the documents issued by Sales Dept.
The GR3770 is a new type of the GR3750 for which 600dpi has been realized.
Special features of the GR3770 are as follows:

- **HIGH-PRECISION IMAGE ACHIEVED BY RESOLUTION OF 600dpi**
  - Adoption of Optical Image Scanner
    - Due to increased size of the image scanner, it is fixed for shipment.
      ⇒ For release, shift the fixing metal and execute Tst Mode No.133. (The instruction sheet is attached to the machine.)
    - Due to increased size of the image scanner, the FB original detection sensor is hidden in FB/HP sensor position. Therefore, the image scanner is shifted for detection of an original copy.

- **ADOPTION OF HIGH-DENSITY INK/DEDICATED MASTER**
  - Use of High-Density Ink (HD ink) Developed to Achieve 600dpi Performance.
    - A special drum dedicated to the GR3770 is mounted which is applicable to the HD ink bottle. (The ink bottle set SW is added.)
      - The Clamp gear has been increased in strength to meet the change in the clamp unit.
      - Although the present color drum is useable, the clamp plate base needs to be changed because of the abovementioned grounds.
  - Use of Dedicated Master (77W) Developed to Achieve 600dpi Performance.
    - Master roll diameter has been increased due to looser winding in comparison with the present master (76W).
      - Master flange size has been increased (due to the above ground.)

- **INCREASE IN PHOTO IMAGE REPRODUCIBILITY THROUGH USE OF CONTRAST ENHANCE MODE**
  - As against the adjustment in γ compensation which was available with the image processing PCB, adjustment in two stages (three stages if including “Normal”) has been made available at the users’ level.

- **REDUCTION IN MASTER-MAKING TIME THROUGH USE OF BOOK MODE**
  - Pre-scanning has been eliminated through use of realtime trimming.
    (However, the overall master-making time was increased due to adoption of 600dpi.)

- **CLAMPING WORK STABILIZED AS CLAMP UNIT HAS BEEN CHANGED**
  - The clamp unit UP & Down movement can be also drived by rotation of the clamp motor as well as opening/closing movement of clamp plate.
  - “T14” is not displayed even if the clamp unit is lowered manually.
  - Mounting on the present models has not been enabled as yet.

- **OTHERS**
  - The original stage glass and the original stopper are each independently provided.
  - The write pulse motor is adjustable in speed.
  - Applicable to New Computer I/F Rev.5.xx. (Not applicable to Rev.4xx.)
  - Applicable to New Sorter I/F specification. (Not applicable to the former Sorter specification.)

3. Specifications

GR3770

• **Processing**	High-speed automatic digital scanning Fully automatic, thermal screening duplicating system
• **Time to First Copy**	Ledger or A3 original / Approx. 29 seconds Letter or A4 original / Approx. 22 seconds
• **Print Speed**	5 selectable print speeds (60, 80, 100, 110, 120 sheets/min.)
• **Scanning Resolution**	600 dpi
• **Original Type**	Bound documents or sheets
• **Original Size**	- **For the Stage Glass:** Max./A3 (297 × 420mm) or Ledger (11 × 17 inch) Min./Business card (50 × 90mm) or 2 × 3 1/2 inch - **In the optional ADF Unit:** Max./A3 (297 × 420mm) or Ledger (11 × 17 inch) Min./A6 (100 × 148mm) or 4 x 6 inch
• **Paper Size**	Max./A3 (297 × 420mm) or Ledger (11 × 17 inc) Min./A6 (100 × 148mm) or 4 × 6 inch
• **Original Weight**	- **For the Stage Glass:** 10 kg or less - **In the optional ADF Unit:** Max./110 g/m^2 Min./50 g/m^2
• **Paper Weight**	Max./210 g/m^2 Min./46 g/m^2
• **Image Area**	A3 Drum/290 × 412mm Ledger Drum/10.7 × 16.5 inch
• **Paper Capacity**	1000 sheets in feed and receiving tray [Based on 64 g/m^2 paper]
• **Optional ADF Capacity**	50 originals
• **Machine Weight**	Approx.116 kg
• **Dimensions** [W × D × H]	In use/1316 × 669 × 634mm In storage/753 × 669 × 634mm
• **Power Source** <Requirements>	Picture Model : 220 to 240 VAC, 50/60 Hz <2.0A> USA Model : 120 VAC, 60 Hz <5.0A> Metric Models : 110 VAC, 60 Hz <5.0A> - 110-V model 220 to 240 VAC, 50/60 Hz <2.0A> - 220-V model
• **Reduction Parameters**	4 selectable reductions (94%, 87%, 82% and 71%) [94%, 77%, 75% and 66% in USA models]
• **Enlargement Parameters**	3 selectable enlargements (141%, 122% and 116%) [141%, 127% and 121% in USA models]
• **Zooming Parameters**	50% to 200%
• **Features**	LCD monitor, Print speed/density control, Confidential mode, Two-up printing, Book document processing, Programmed printing, Memory mode, Contrast enhance mode, Dot screen mode, Interface capabilities, Photo mode, Automatic idle and Automatic scanning contrast adjustment
• **Print Colors**	Black, blue, red, green, brown, yellow and etc.
• **Optional Accessories**	Color drum unit, A4 drum unit, ADF III(S) unit, Digitizer III(S), TM2500 sorter, TM5000 sorter, Sheet feeder SF3000, Key/Card counter III(S), Job separator III and Computer interface

4. PRODUCT COMPATIBILITY

Accessory Compatibility chart

PRODUCT \ APPLICABLE MODEL	GR3770	GR3750	GR2750	GR2710	GR1750	GR1700
GR3770 Black Drum	○	×	×	×	×	×
GR Color Drum A3	△	○	×	×	×	×
GR Drum B4/A4	×	×	○	○	○	○
GR3770 Black A4 WIDE Drum	○	×	×	×	×	×
GR Color Drum A4 WIDE	△	○	×	×	×	×
ADF UNIT III (S)	○	×	×	×	×	×
ADF UNIT III	×	○	○	○	×	×
Sheet Feeder SF3000	○	○	○	○	○	○
TM5000 Sorter	○	○	○	○	○	○
TM2400 Sorter	×	○	○	○	○	○
TM2500 Sorter	○	○	○	○	○	○
DIGITIZER III (S)	○	○	○	×	×	×
DIGITIZER III	×	○	○	×	×	×
Key/Card Counter III (S)	○	○	○	○	○	○
Key/Card Counter III	×	○	○	○	○	○
Job Separator III	○	○	○	○	○	○
GR Precision Stacking Tray	○	○	○	○	○	○
Interface Board III (S)	○	○	○	○	○	○
Interface Board III	×	○	○	○	○	○

○ : Fully Compatible
△ : Color Drum only
× : Not Compatible

Consumables Compatibility Chart

APPLICABLE MODEL / PRODUCT	GR3770	GR3750	GR2750, 2710, 1750, 1700
RISOGRAPH GR MASTER 77W	○	×	×
RISOGRAPH GR MASTER 76W	×	○	×
RISOGRAPH GR MASTER 75	×	×	○
RISOGRAPH GR INK HD (BLACK)	○	×	
RISOGRAPH GR INK (BLACK)	×	○	
RISOGRAPH GR INK (RED)	○		
RISOGRAPH GR INK (BLUE)	○		
RISOGRAPH GR INK (BROWN)	○		
RISOGRAPH GR INK (GREEN)	○		
RISOGRAPH GR INK (YELLOW)	○		
RISOGRAPH GR INK (GRAY)	○		
RISOGRAPH GR INK (LIGHT GRAY)	○		
RISOGRAPH GR INK (MARINE RED)	○		
RISOGRAPH GR INK (BRIGHT RED)	○		
RISOGRAPH GR INK (BURGUNDY RED)	○		
RISOGRAPH GR INK (FEDERAL BLUE)	○		
RISOGRAPH GR INK (MEDIUM BLUE)	○		
RISOGRAPH GR INK (PURPLE)	○		
RISOGRAPH GR INK (TEAL)	○		
RISOGRAPH GR INK (FLAT GOLD)	○		
RISOGRAPH GR INK (ORANGE)	○		
RISOGRAPH GR INK (HUNTER GREEN)	○		
* ORDER COLORS	○		

2. DRUM SECTION

CONTENTS

[Theory of Operation]
1. Drum Insertion Error Preventive System 2-1
2. Ink Bottle Detecting System 2-2
3. Ink Supply System 2-3

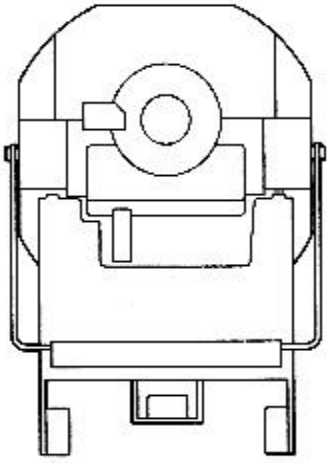
[Removal]
1. Ink Bottle Set SW Ass'y 2-4

1. THEORY OF OPERATION

1. DRUM INSERTION ERROR PREVENTIVE SYSTEM

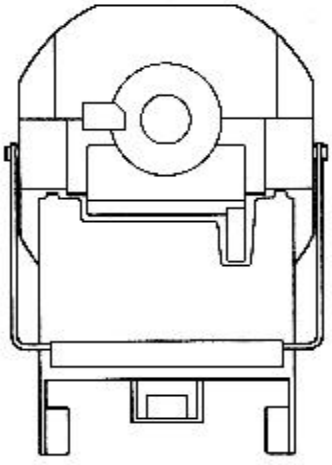
The drum cover (lower) differs in shape so that the GR3770 dedicated drum is not inserted into the GR3750 machine by mistake. On the other hand, GR3750 drum can be inserted into the GR3770, thus enabling common use of the color drum.

GR3770 Drum



GR 3770

GR Drum

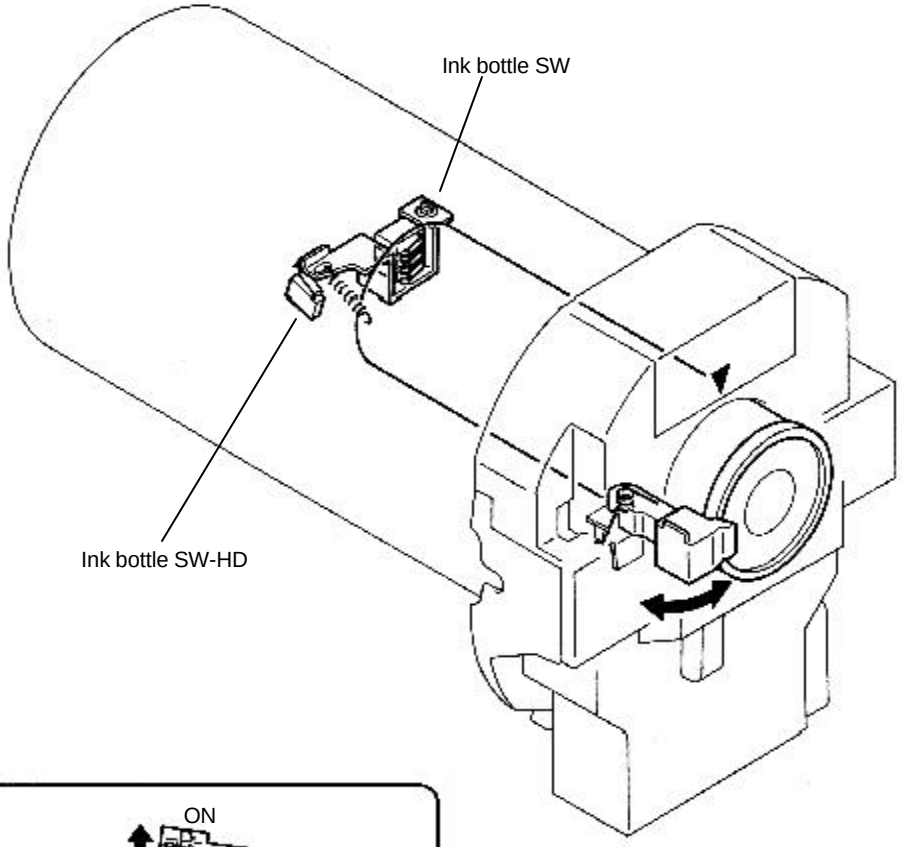


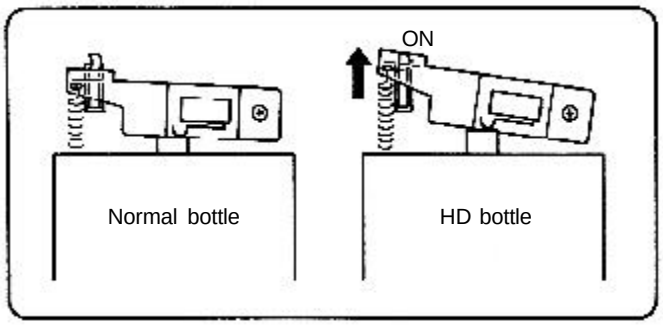
GR Machine

Test Mode No.55 Bottle set SW1
No.56 Bottle set SW2
No.57 Bottle set SW3
No.17 Bottle set SW-HD

2. INK BOTTLE DETECTING SYSTEM

Ink Bottle SWs 1/2/3 as well as Ink Bottle SW-HD detects if an ink bottle appropriate for the drum has been set in position.

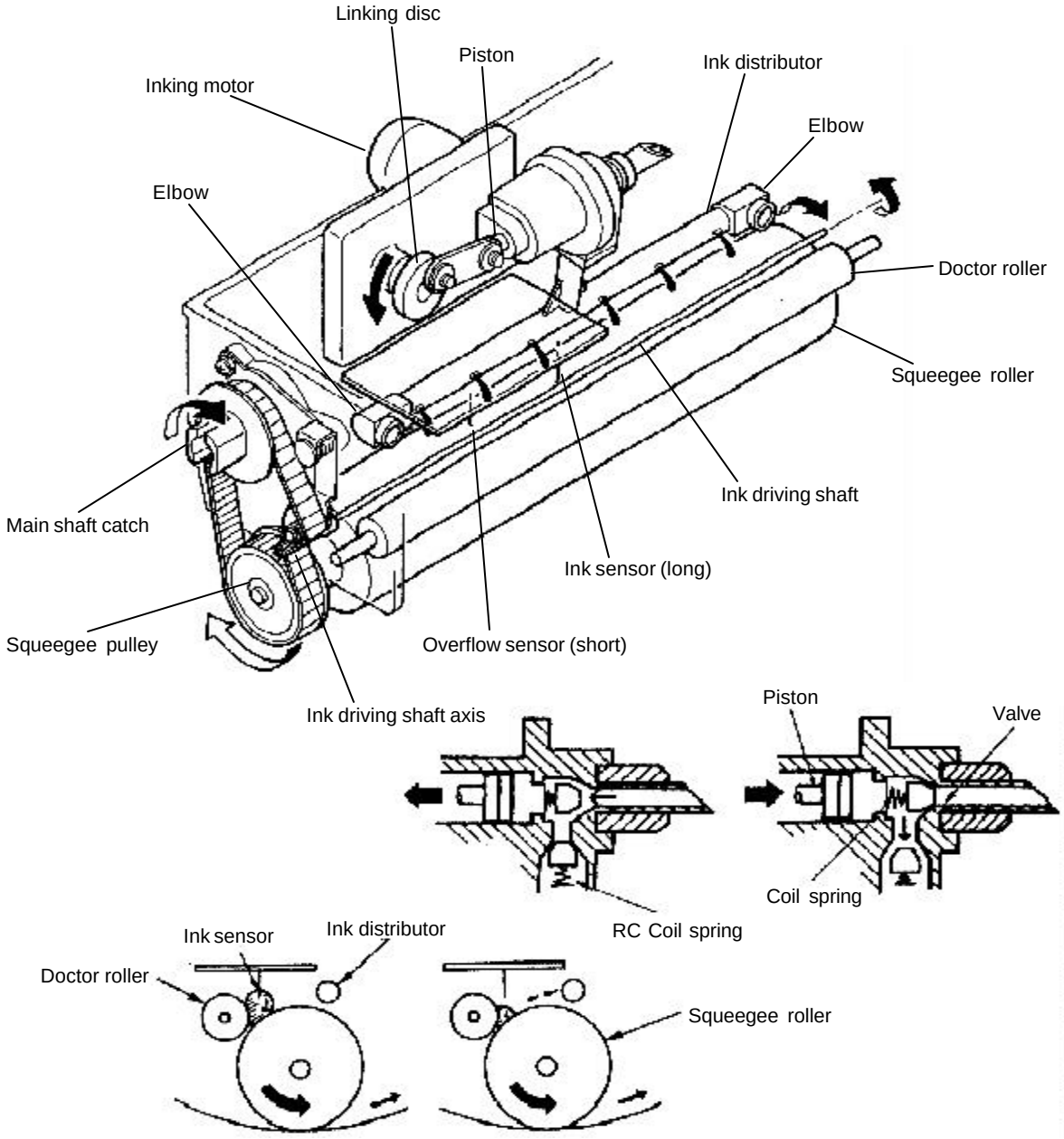




* If Ink Bottle SW has not been pushed, “INSTALL INK CARTRIDGE” message is displayed.
* If Ink Bottle SW has been pushed in wrong combination, “WRONG-TYPE INK CARTRIDGE INSTALLED” message is displayed.

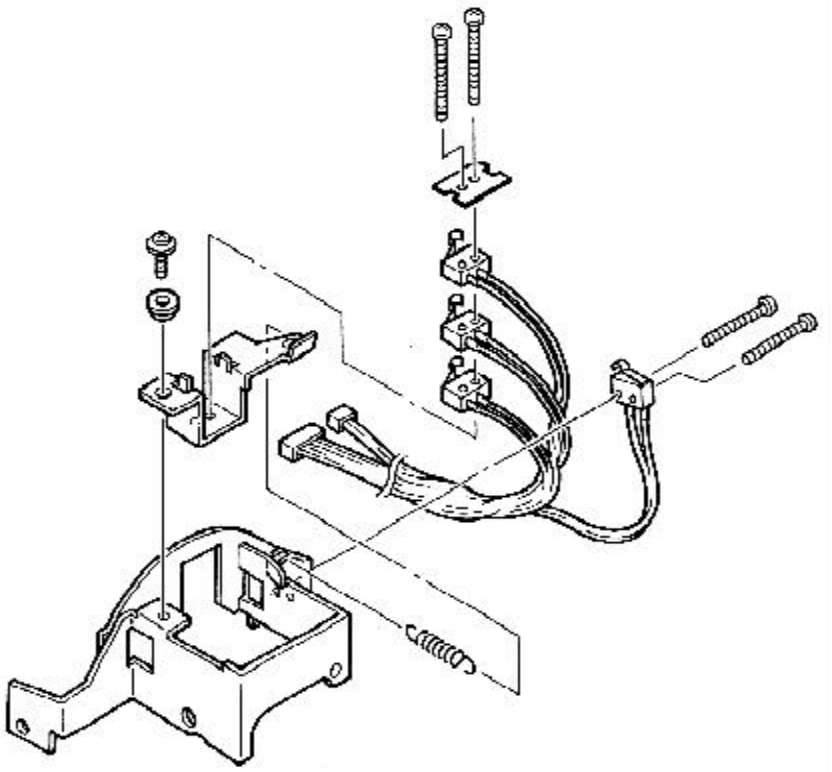
3. INK SUPPLY SYSTEM

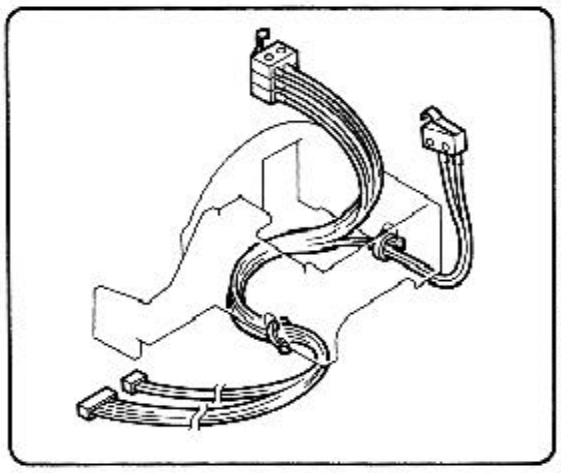
As the Main shaft catch rotates, the squeegee roller and the ink driving shaft are turned. There is a slight gap between the squeegee roller and the doctor roller, through which ink, applied on the squeegee roller, is supplied inside the drum. A swirl of ink is produced on the driving shaft and is rotated along with the shaft, where the swirl is maintained in consistent size. As ink is used in printing and the ink swirl gets apart from the ink sensor, the ink motor is turned ON so that ink is sucked from the ink bottle by the ink pump until ink comes in contact with the ink sensor. Further, ink is supplied through the ink distributor on to the squeegee roller.
Ink held by the ink distributor is all supplied to the squeegee from the elbows at both ends of the distributor. Occurrence of overflow of ink in the drum is detected by the overflow sensor.



2. REMOVAL

1. INK BOTTLE SET SW ASSY.





3. FLAT BED IMAGE SCANNING SECTION

CONTENTS

[Theory of Operation]

1. Scanner Table Setting System 3-1
2. Stop Position of Image Scanner 3-2
3. Image Scanner Position Detecting System 3-3
4. Flat Bed Original Set Confirming System 3-6
5. Flat Bed Auto Scanning Contrast Adjustment System 3-7
6. Flat Bed Image Scanning System 3-8

[Removal]

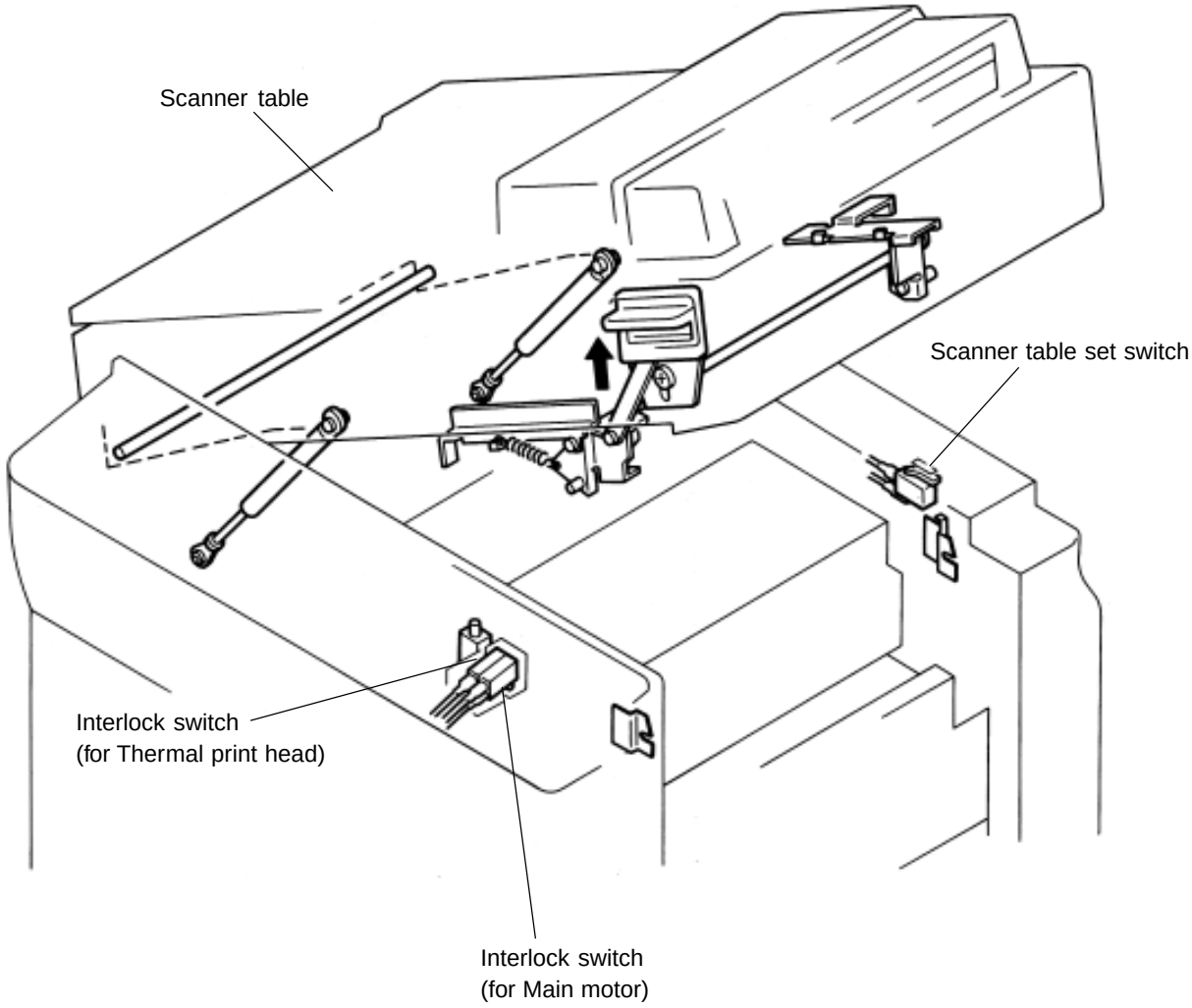
1. Stage Glass 3-10
2. Image Scanner Unit 3-11
3. Flat Bed Original Detection Sensor and Image Flexible Wire 3-12
4. Flat Bed Read Pulse Motor Unit 3-13
5. Original Stopper and Shading Glass 3-14

Test Mode No.21 : Scanner table set switch
No.39 : Inter lock switch

1. THEORY OF OPERATION

1. SCANNER TABLE SETTING SYSTEM

Flat Bed Set SW detects if the scanner table has been set in position.
When the scanner table is left open, the interlock switch neither for the thermal print head nor for the main motor can be pushed, where power supply to the main motor and to the thermal head is cut off.

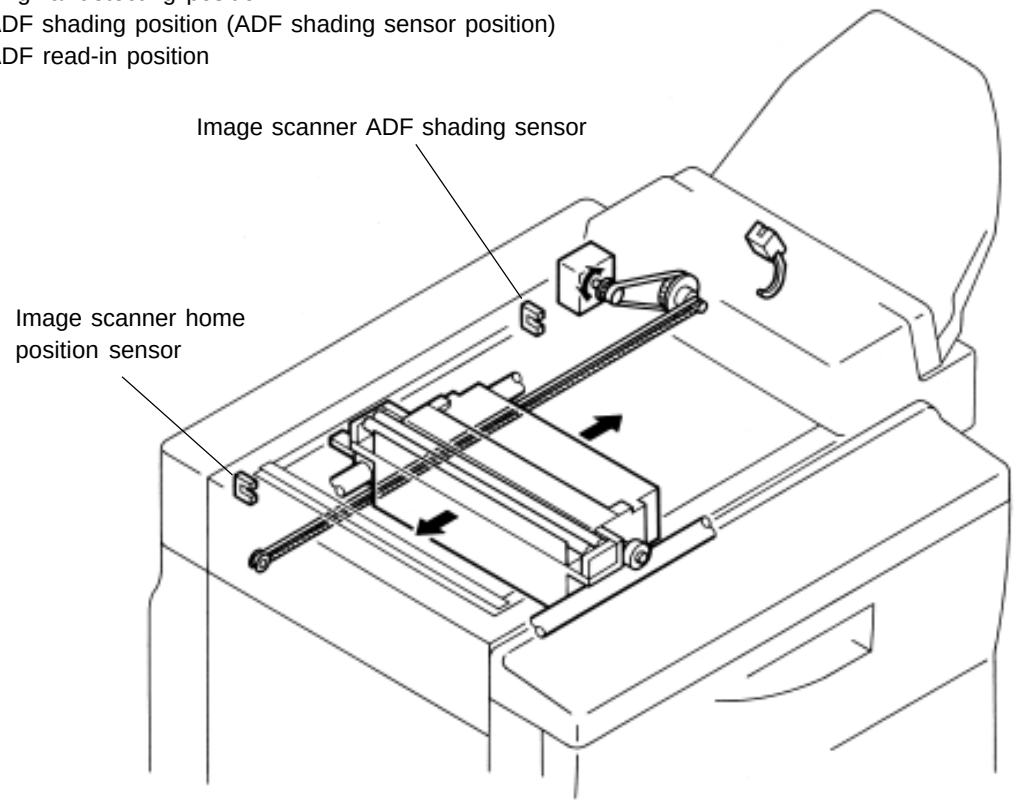


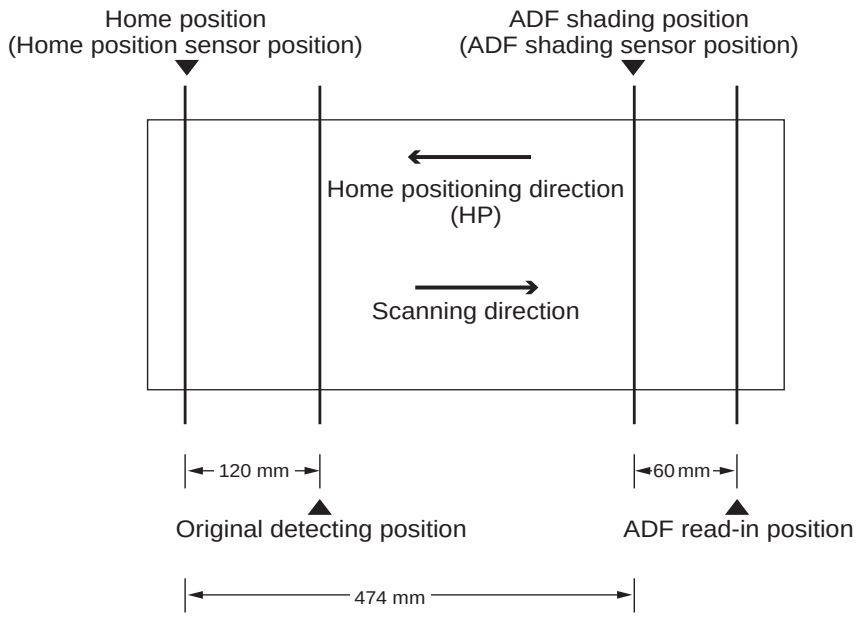
* If Scanner table Set Switch or Interlock Switch (for main motor) has not been pressed, “CLOSE SCANNER TABLE” message is displayed.

2. STOP POSITION OF IMAGE SCANNER

Positions for the image scanner to stop include the following four:

- Home position (Image scanner home position sensor position)
- Original detecting position
- ADF shading position (ADF shading sensor position)
- ADF read-in position



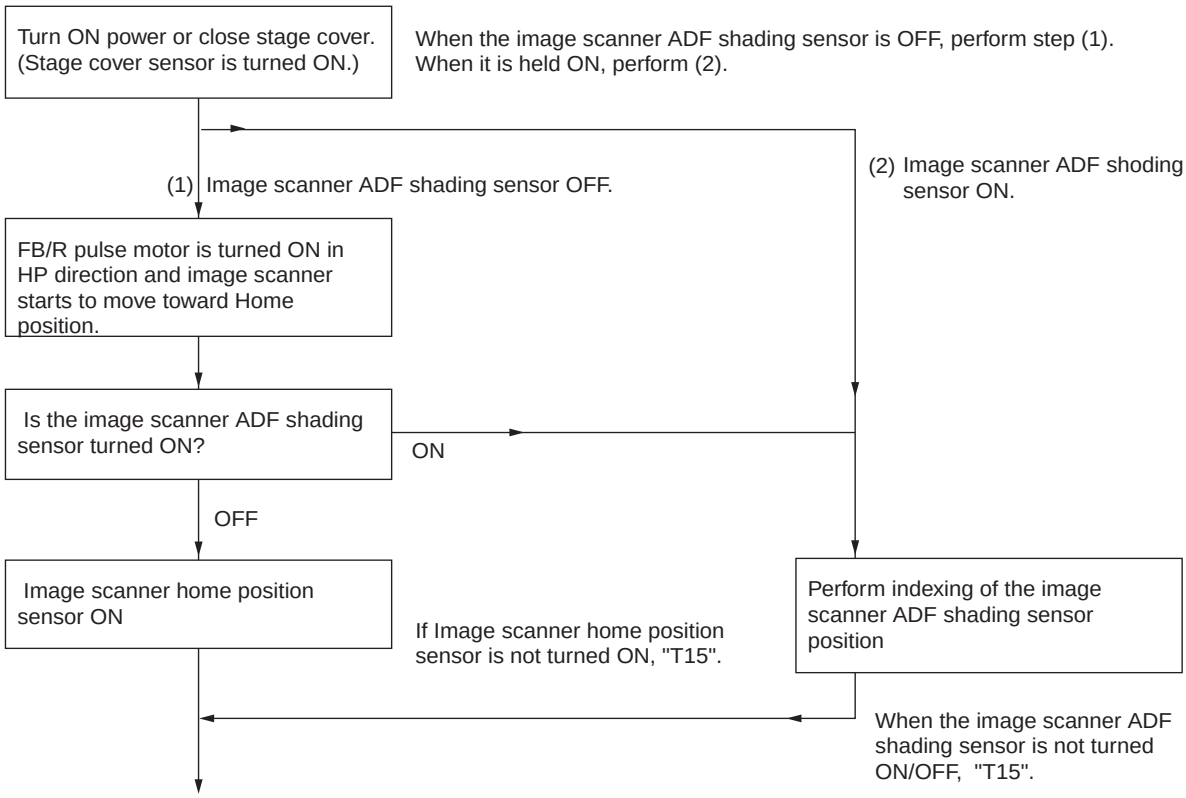


* The correct Home position sensor position is in the Home position sensor ON → OFF position.

* The correct ADF shading sensor position is 1mm apart from the ADF shading sensor OFF → ON position when the image scanner has moved toward scanning.

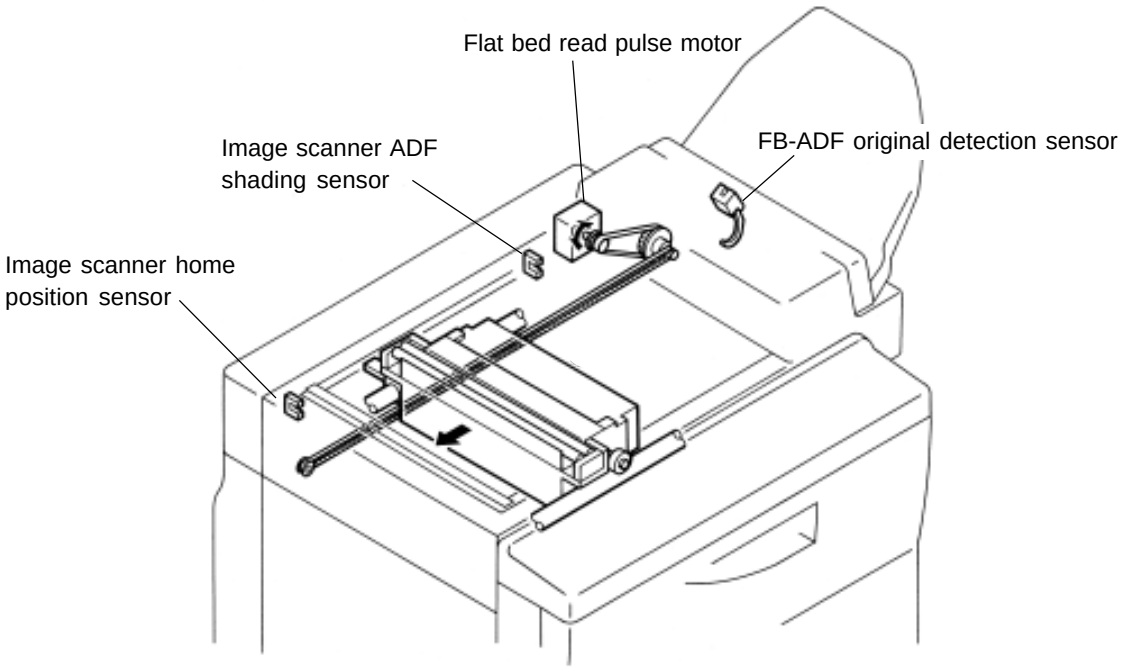
3. IMAGE SCANNER POSITION DETECTING SYSTEM

On supply of power or on closing of the stage cover, if the image scanner is not in the Home position sensor position, image scanner position detection is performed.


Turn ON power or close stage cover.
(Stage cover sensor is turned ON.)
When the image scanner ADF shading sensor is OFF, perform step (1).
When it is held ON, perform (2).
(1) Image scanner ADF shading sensor OFF.
(2) Image scanner ADF shoding sensor ON.
FB/R pulse motor is turned ON in HP direction and image scanner starts to move toward Home position.
Is the image scanner ADF shading sensor turned ON?
ON
OFF
Image scanner home position sensor ON
If Image scanner home position sensor is not turned ON, "T15".
Perform indexing of the image scanner ADF shading sensor position
When the image scanner ADF shading sensor is not turned ON/OFF, "T15".

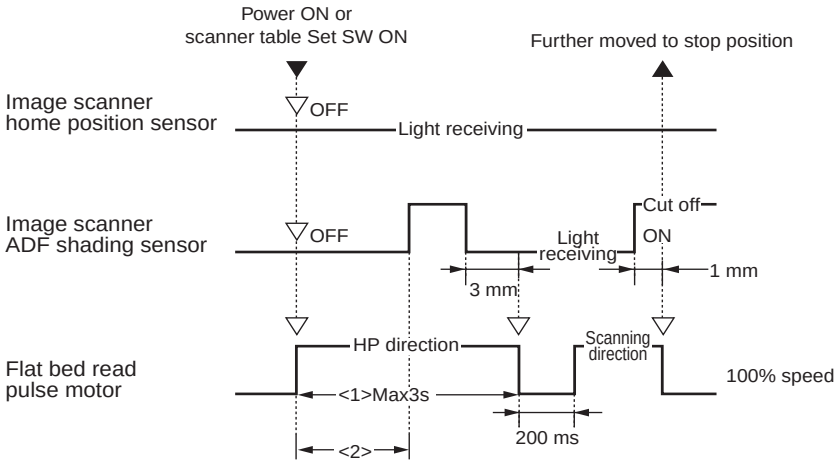
According to status, shift the image scanner to the following stop position:

- When the FB-ADF original detection sensor is OFF and the stage cover sensor is ON, stay as it is.
- When the FB-ADF original detection sensor is OFF and the stage cover sensor is OFF, move to "FB original detection position".
- When the FB-ADF original detection sensor is ON, move to "image scanner ADF shading sensor position".

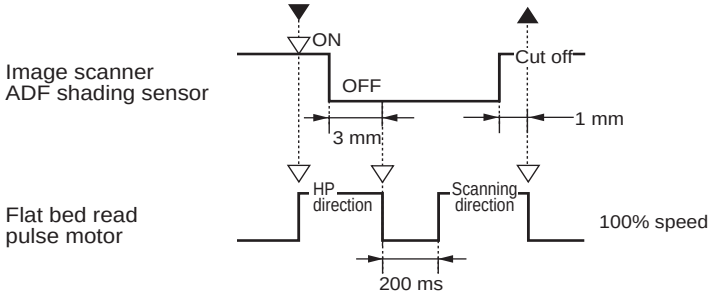

Flat bed read pulse motor
Image scanner ADF shading sensor
FB-ADF original detection sensor
Image scanner home position sensor

TIMING CHART OF IMAGE SCANNER POSITION DETECTION

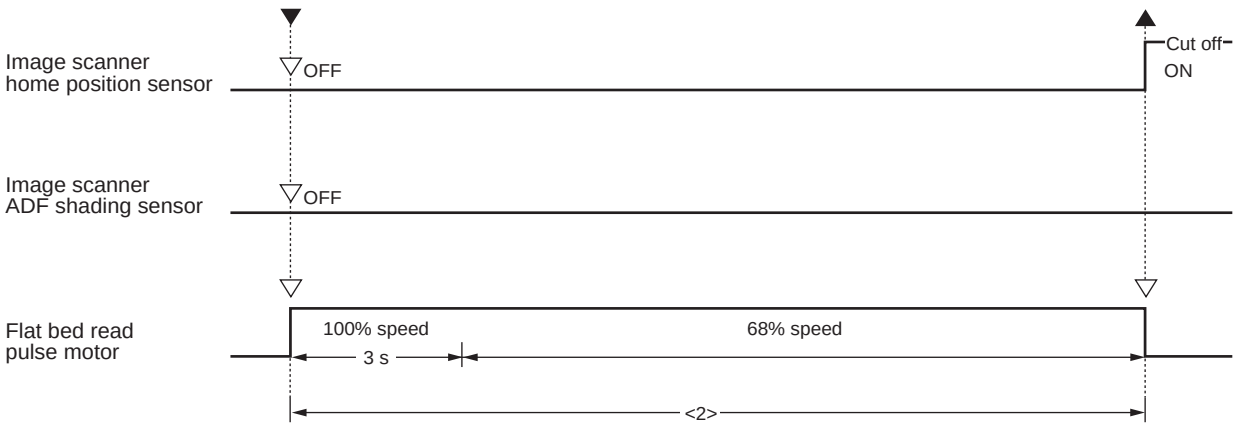
(1) When the image scanner is held close to the ADF read-in position:



(2) When the image scanner is in the image scanner ADF shading sensor position:



(3) When the image scanner is held between the image scanner home position sensor and the image scanner ADF shading sensor:



<1> When the image scanner ADF shading sensor or the image scanner home position sensor is not turned ON within 3 seconds after the flat bed read pulse motor gets ON, Step (3) takes place.

<2> “WAIT A MOMENT” message is displayed until the image scanner ADF shading or the image scanner home position sensor gets ON.

* Occurrence of the following is judged as Flat Bed Read Pulse Motor Lock and “T15 CALL SERVICE” message appears.

T15 (Flat Bed Read Pulse Motor Lock)
• The image scanner home position sensor not turned ON/OFF. • The image scanner ADF shading sensor not turned ON/OFF. • Image scanner home position sensor and the image scanner ADF shading sensor turned ON simultaneously.

4. FLAT BED ORIGINAL SET CONFIRMING SYSTEM

The flat bed original detection sensor serves to confirm that an original has been set on the stage glass.

Open the stage cover.
(Stage cover sensor is turned OFF.)

↓

Image scanner moves to the original detecting position.

Original detecting position is 120mm away from the home position in scanning direction.

↓

Set an original and close the stage cover.
(Stage cover sensor turned ON.)

Optical axis of the stage cover sensor is cut off.

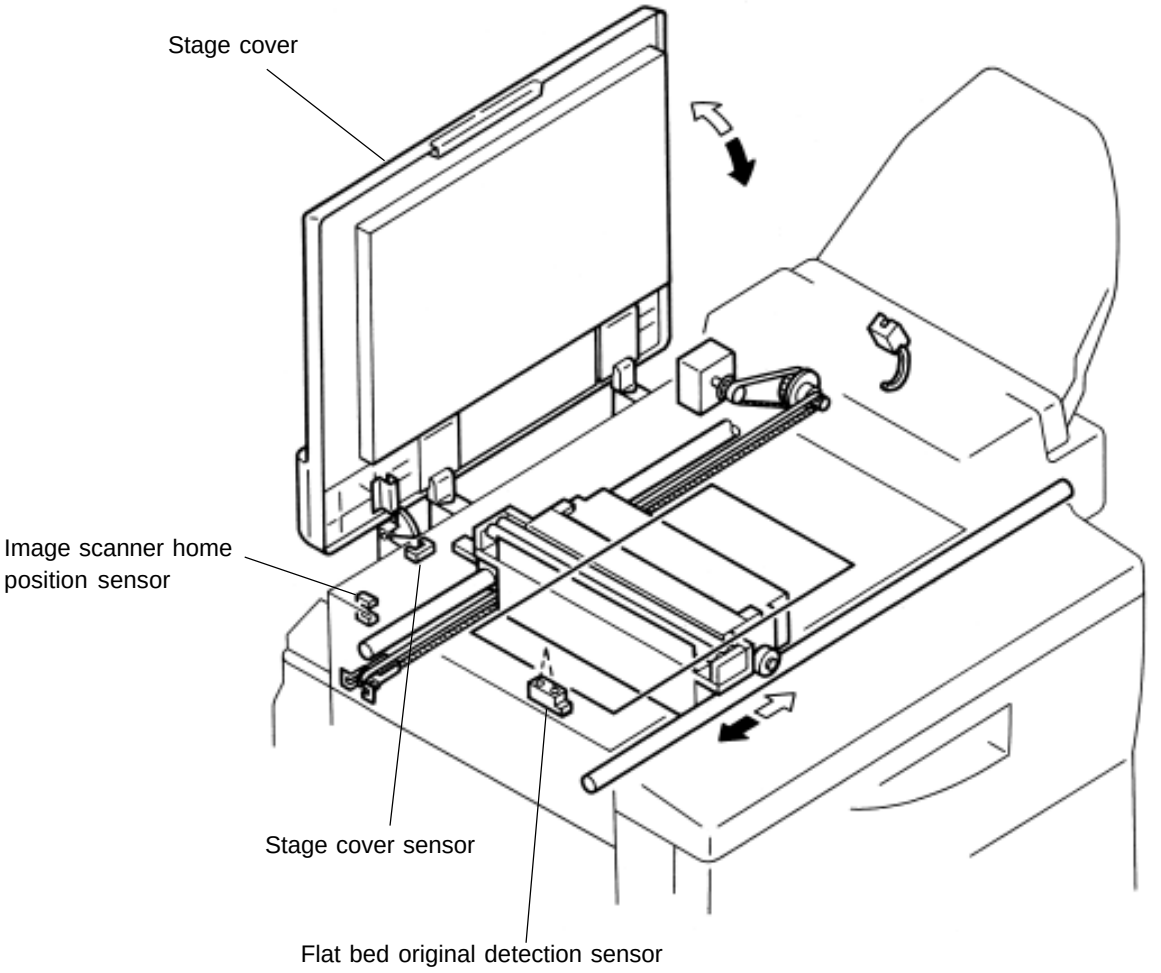
↓

Flat bed original detection sensor confirms that an original is held.

When an original has been set, panel display changes into "Master making" and the thermal head is lowered.

↓

Image scanner returns to the home position.



5. FLAT BED AUTO SCANNING CONTRAST ADJUSTMENT SYSTEM

This is made effective only when original scanning density is set to “AUTO”.
Further, the “auto Scanning Contrast Adjustment function” does not operated in Photo, Line/Photo Mixed (DUO), or Dot mode.

<START> key ON

If the image scanner is not in the home position, the following step starts when the image scanner home position sensor is turned ON.

↓

Image scanner LED lights up and shading correction is performed.

↓

Flat bed read pulse motor is turned ON and the image scanner starts to move in scanning direction.

↓

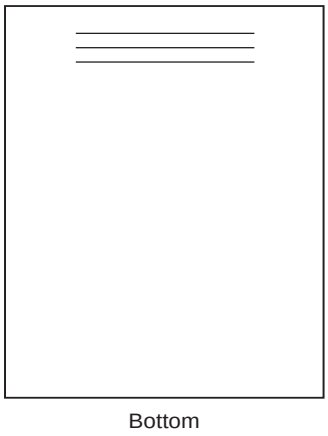
Original top three lines are read in.

↓

Image scanner returns to the home position.

↓

To FB reading or Bound original reading step.



From the top of an original:
Approx. 9mm
Approx. 12mm
Approx. 15mm

6. FLAT BED IMAGE SCANNING SYSTEM

The original reading area, in general, depends on size of sheet set on the Paper feed tray. When Bound Original mode is ON, realtime trimming is performed.

<START> key ON

When original scanning density is in "AUTO", FB auto scanning contrast Adjustment is first performed.

↓

Image sensor LED is lit and shading correction is performed.

↓

Flat bed read pulse motor gets ON and the image scanner starts to move in scanning direction.

↓

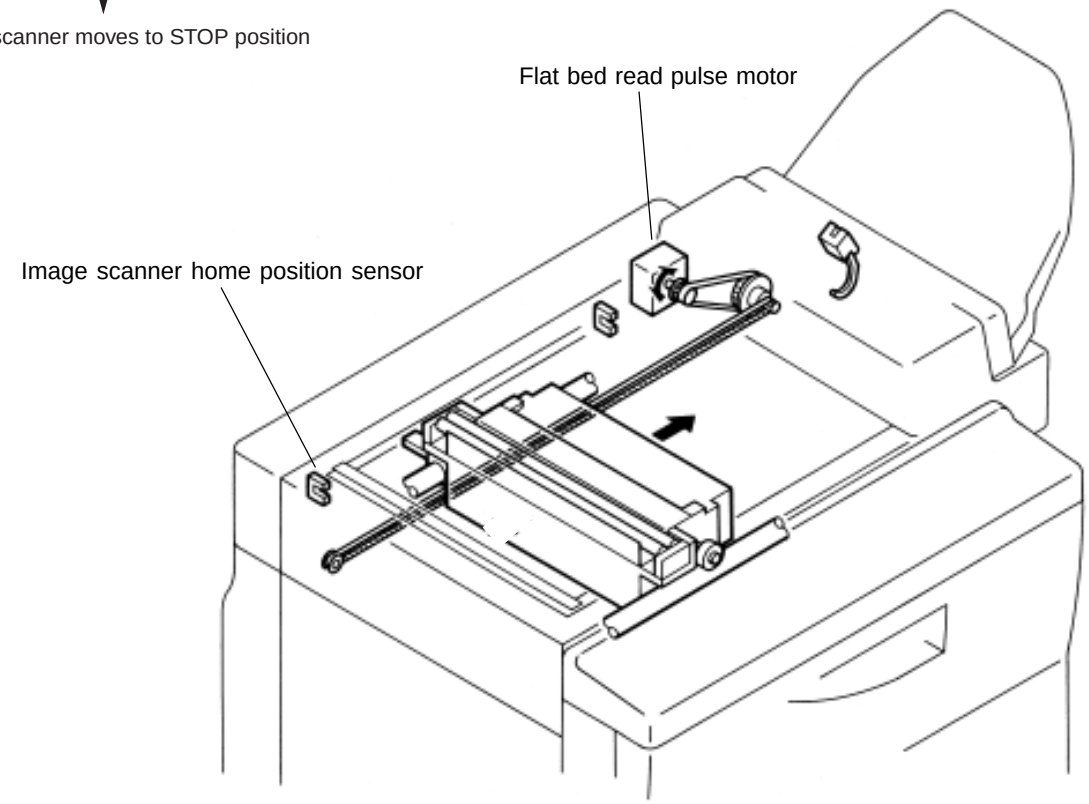
Skipping to read approximately 5mm of the original top part, reading/writing starts.

↓

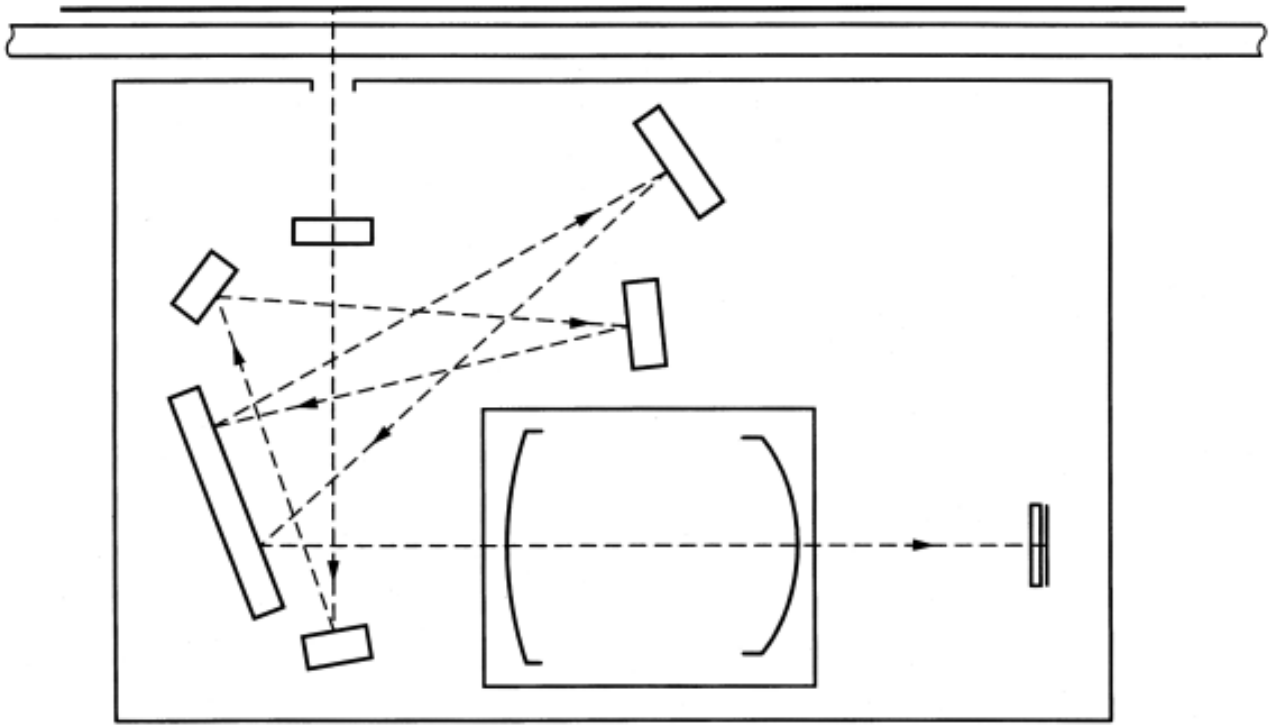
On completion of reading/writing for size well corresponding to the printing sheet, the image scanner LED is put OFF and the flat bed read pulse motor is turned OFF.

↓

Image scanner moves to STOP position



SECTIONAL VIEW OF IMAGE SCANNER



2. REMOVAL

1. STAGE GLASS

REMOVAL

1) Turn off the power and remove the ADF unit.
2) Remove mounting screws (× 2) of the glass holder (R), remove the holder.
3) Shifting the stage glass rightward, lift it up for removal.

CAUTION ON MOUNTING

• Shifting the stage glass and the glass holder (right) toward the original stopper, fix it properly. (See Fig. a.)

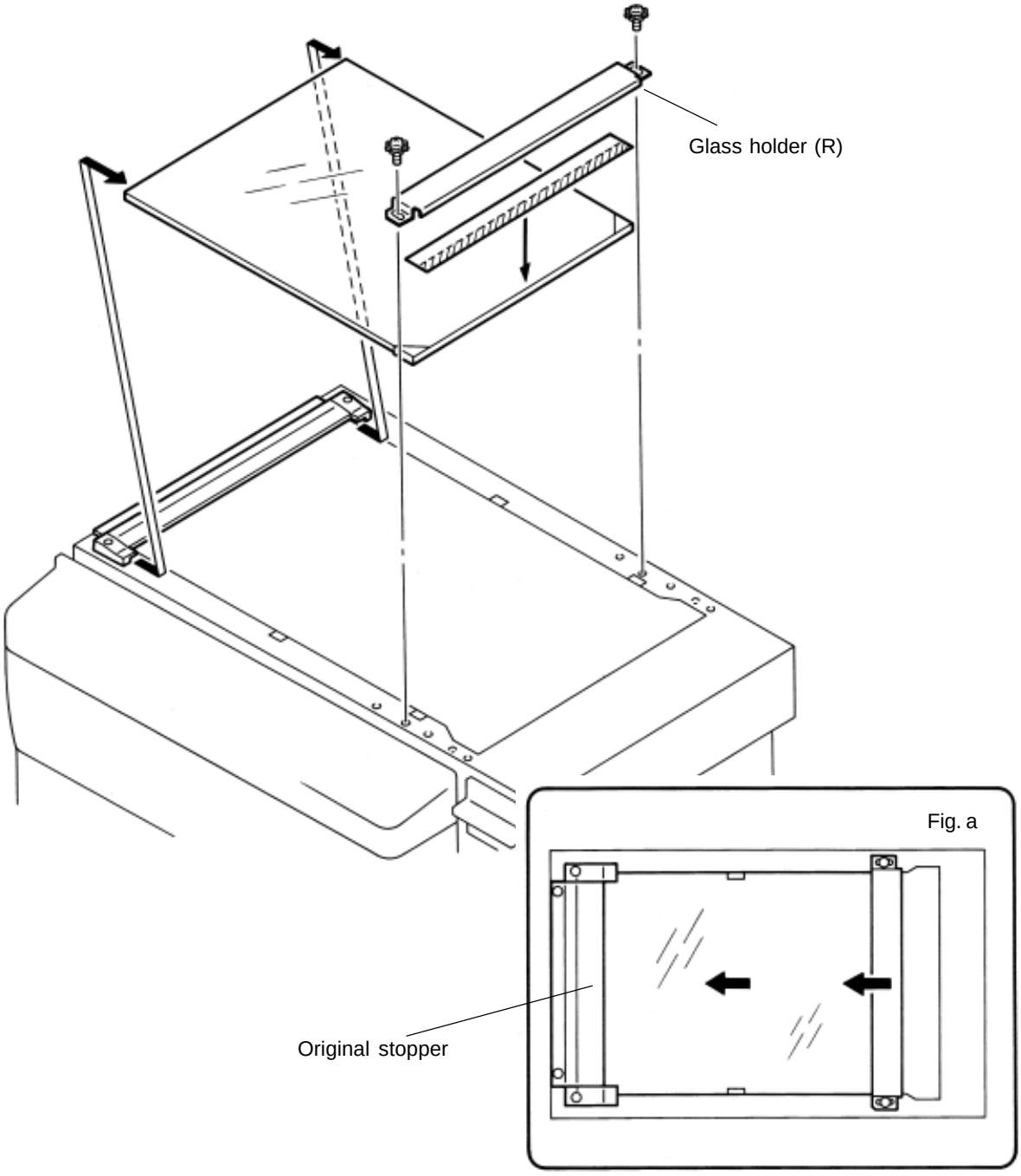
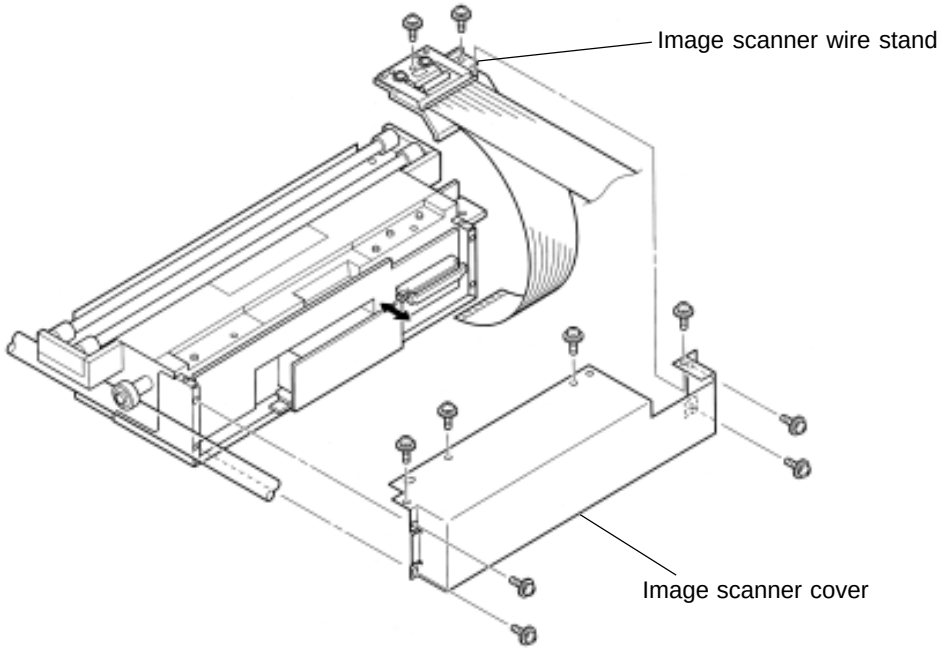


Fig. a

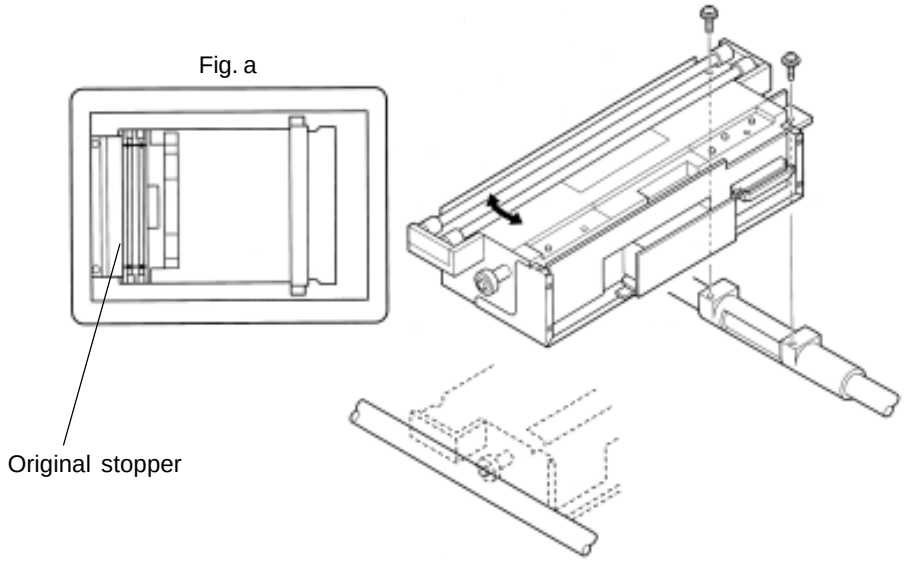
2. IMAGE SCANNER UNIT

REMOVAL

1) Turn off the power and remove the stage glass.
2) Remove mounting screws (× 8) of the image scanner cover, remove the cover.
3) Remove mounting screws (× 2) of the image scanner wire stand, raise the stand.



4) Pulling out the image scanner connector, take out the flexible wire.
5) Remove mounting screws (× 2) of the image scanner unit, raise the scanner upward for removal.



- Precautions in Assembly -

- Mount the image scanner unit in parallel with the original stopper. (See Fig.a.)
- For fitting the image flexible wire, pulling out the connector once, insert the wire to the end and, then, push the connector into.

3. FLAT BED ORIGINAL DETECTION SENSOR AND IMAGE FLEXIBLE WIRE

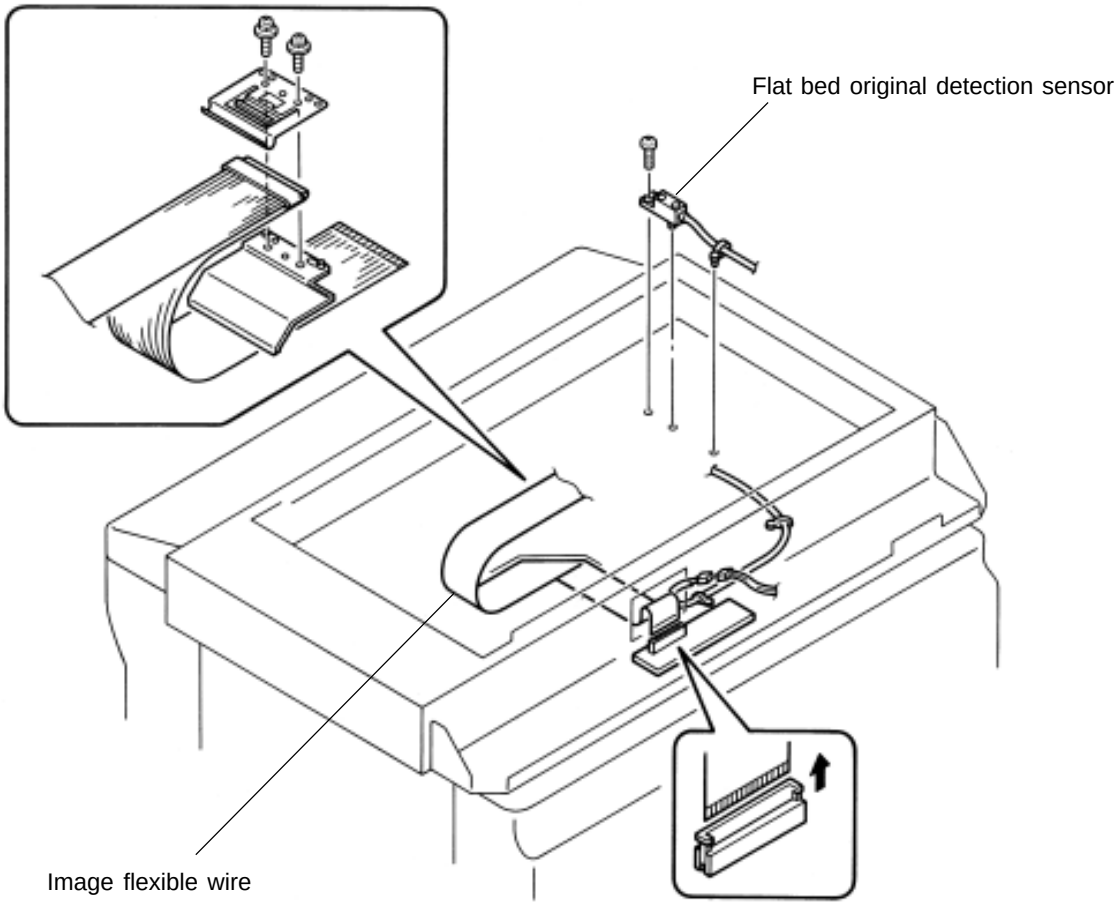
1) Turn off the power and remove the stage glass.

FLAT BED ORIGINAL DETECTION SENSOR

2) Remove mounting screw of the flat bed original detection sensor, cut off the wire band and disconnect the connector to remove the sensor.

IMAGE FLEXIBLE WIRE

2) Taking off the image scanner cover and the image scanner wire stand, pull out the image scanner connector to take out the flexible wire.
3) Pulling out the image flexible wire connector on the FBI PCB, remove the flexible wire.



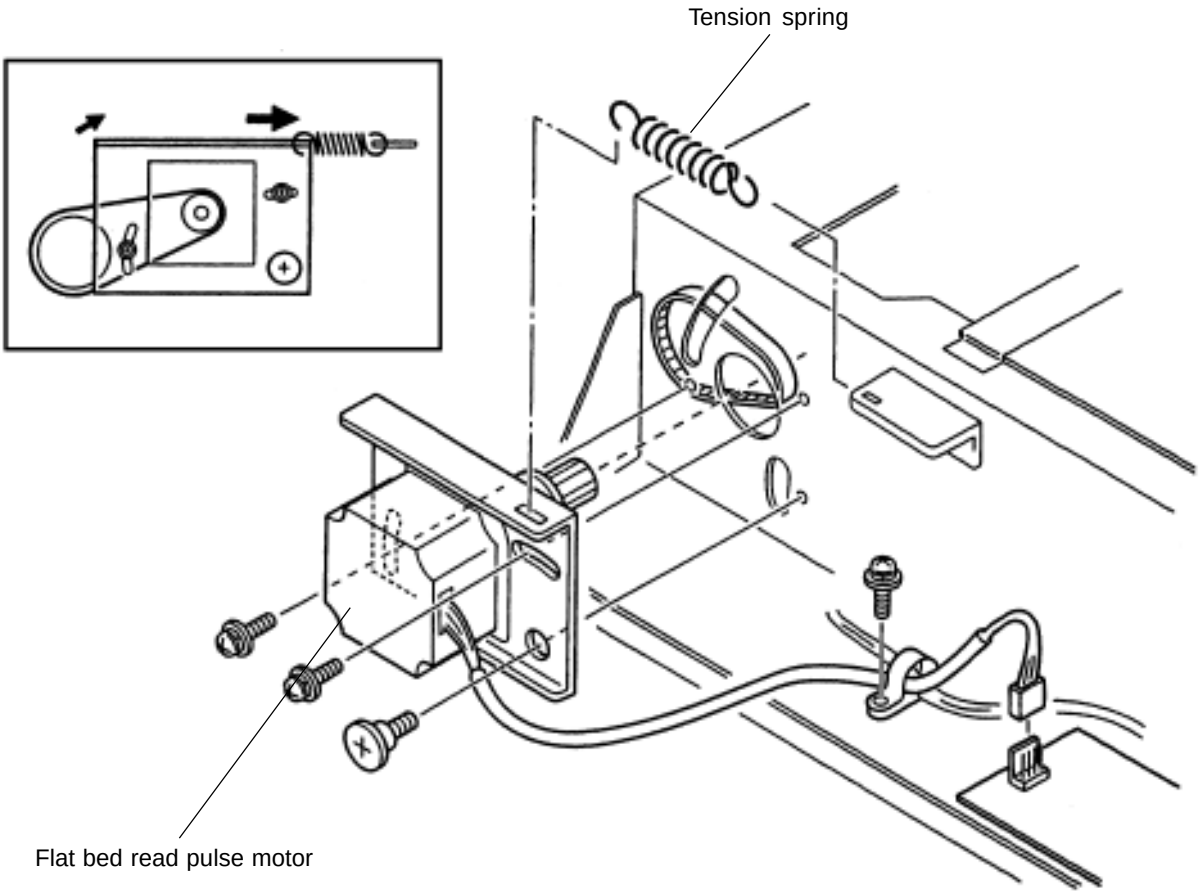
4. FLAT BED READ PULSE MOTOR UNIT

REMOVAL

1) Turn off the powr and remove the following parts:
   • ADF unit
   • Stage cover, Scanner cover (rear)
2) Remove the tension spring.
4) Remove the support screw (step flat screw) and mounting screws (× 2) of the flat bed read pulse motor unit, disconnect the motor connector to remove the unit.

MOUNTING

1) Applying the belt to the pulley of the flat bed read pulse motor, temporarily fix the motor unit with screws (× 2).
2) Tightly fasten the support screws.
3) Fitting the tension spring (so that tension is automatically applied to the belt), tightly fasten with screws (× 2).

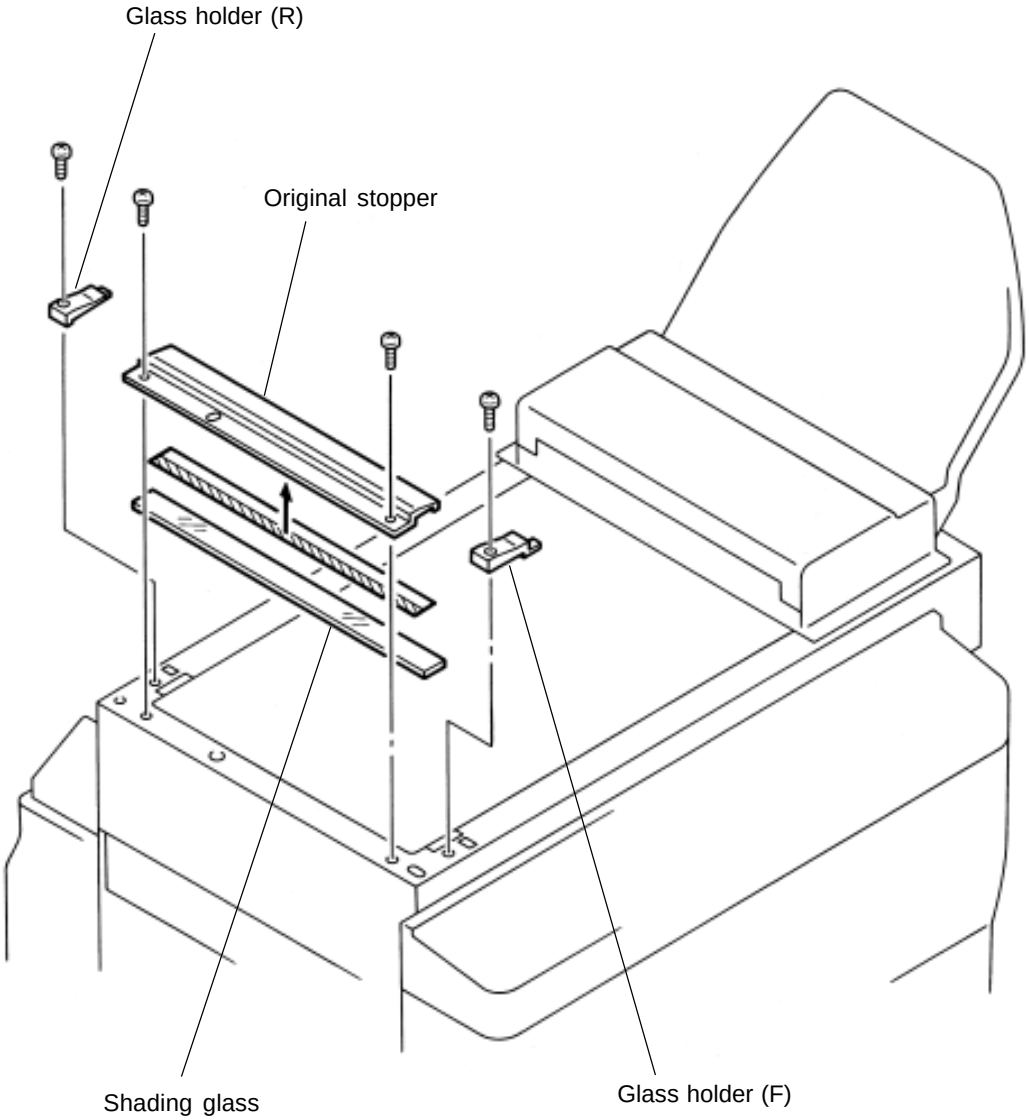


5. ORIGINAL STOPPER AND SHADING GLASS

The original stopper is correctly positioned and fitted prior to shipment.
Therefore, pay enough attention when you remove it.

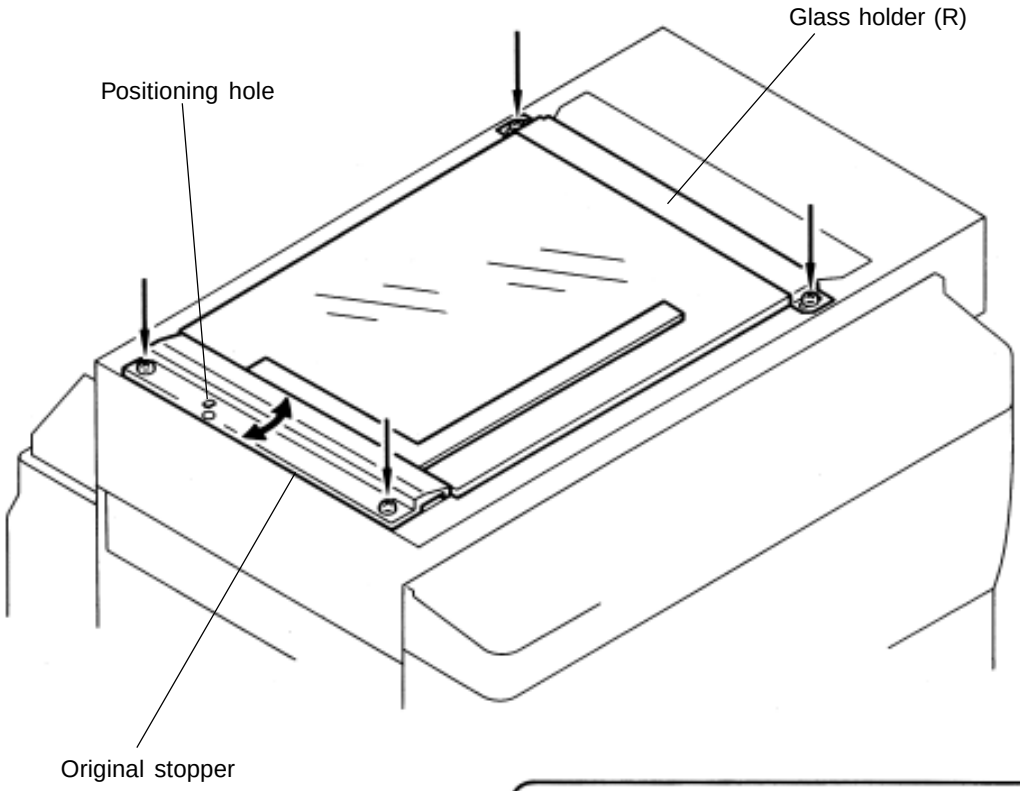
REMOVAL

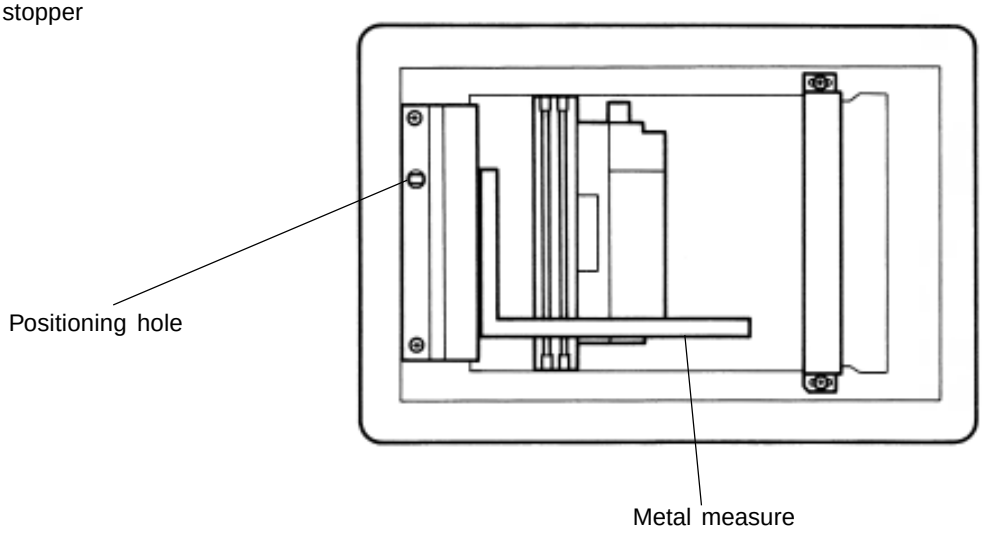
1) Turn off the power and remove the following parts:
   • Stage cover, Scanner covers (rear/front/left)
2) Remove mounting screws of the glass holder (front & back), remove the holder.
3) Remove mounting screws (× 2) of the original stopper, remove the stopper and the shading glass.



MOUNTING

1) Confirming that both the shading glass and the shading plate are free of contamination, temporarily fasten the glass and the original stopper with fixing screws (× 2).
2) Loosen, beforehand, fixing screws (× 2) of the glass holder (right).
3) Applying a metal measure to the original stopper, place it on the stage glass.
4) Turning ON Test Mode No108 (Flat Bed Read pulse motor), shift the image scanner and move the original stopper so that the corresponding part of the image scanner can move along the metal measure.
   At this time, also adjust the positioning hole to approximate position.
5) Tightly fastening fixing screws (× 2) of the original stopper, fix the stopper.
6) Fasten the fixing screws on the front and the rear of the glass holder.
7) Shifting the stage glass and glass holder (R) toward the original stopper, fasten the holder screws (× 2).





4. MASTER MAKING SECTION

CONTENTS

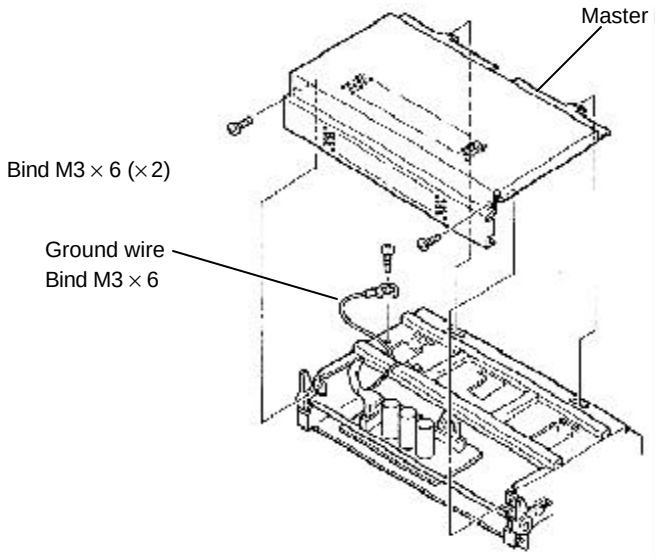
[Removal]
1. Thermal Print Head 4-1
[Adjustment]
1. Thermal Power of Thermal Print Head 4-3

1. REMOVAL

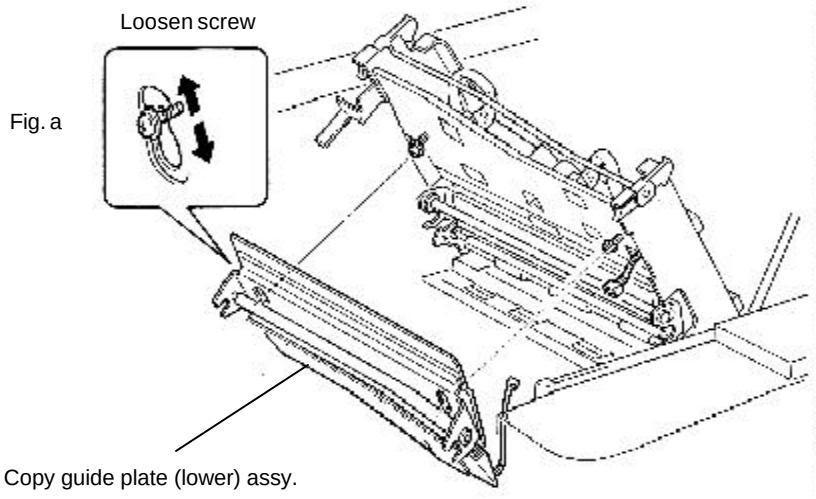
1. THERMAL PRINT HEAD

REMOVAL

1) Turn ON the power and open the Scanner table. Then turn OFF the power. (The thermal print head is raised automatically.)
2) Remove mounting screws (× 2) of the master making unit cover, remove the cover.
3) Remove the fixing screws of thermal print head ground wire, raise the ground wire.

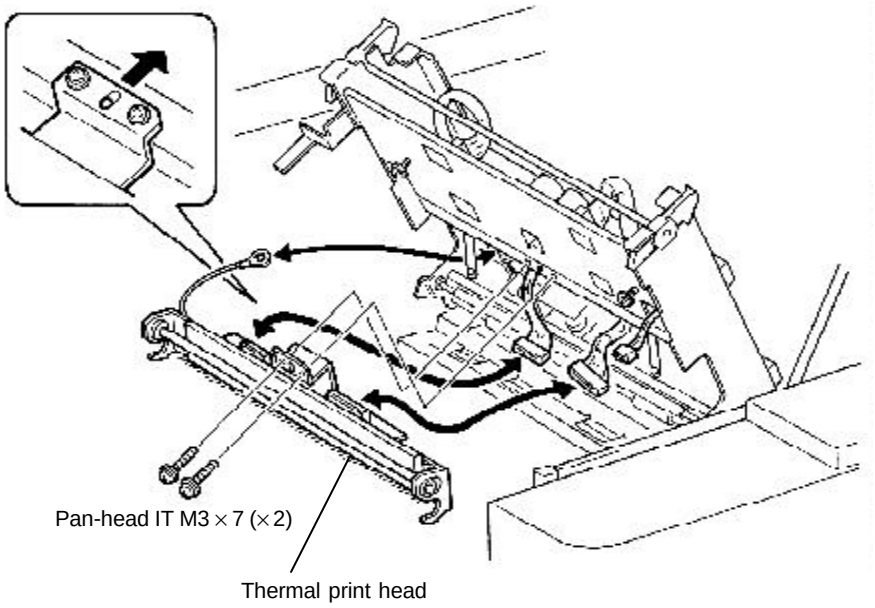


4) Open the master making unit, place the sheet under the thermal print head so that the screw will not fall into Machine.
5) Loosen the fixing screws (× 2) of the copy guide plate (lower) assy, disconnect the connector from the master end sensor light receiving section to remove the assembly.



6) Remove mounting screws (× 2) of the thermal print head, disconnect connectors (x 2) and remove the unit.

Fig. b



- Precautions in Removal -

- Be careful not to damage the heating elements of the thermal print head.
- Be careful not to touch the metal pins of the connectors.
  Static electricity from your body may damage the thermal print head.

- Precations in Assembly -

- For fixing the thermal print head, first adjusting half-pierce, apply the screw to the frame of the master-making unit to fasten it. (Fig. b)
- Be sure to adjust the thermal power each time the thermal print head is replaced, referring to the page 4-4.

2. ADJUSTMENT

1. THERMAL POWER OF THERMAL PRINT HEAD

PROCEDURE

1) Turn off the power, and remove the Front right cover.
2) Connect a voltmeter between pins TP1(+) and TP2(GND) on the power supply PCB.
3) Turning ON Test Mode No.77 (TPH/CTL signal), confirm that the voltage displayed on the voltmeter conforms to the setting table according to the thermal print head resistance value.
5) If not, adjust it by turning 100V system: VR100/VR101 and 200V system: VR401/VR402 on the power supply PCB.
6) On completion of adjustment, turn off the power and detach the voltmeter.
7) Carry out master-making and confirm results.

- Precautions in Adjustment -

- This adjustment has to be made every time the thermal print head is replaced.
- The Scanner table should be closed to apply power to the thermal print head. Othewise, the interlock SW will interrupt the power.

- Results of misadjustment -

- If the voltage is too high ; solid print image will be deformed and the heating elements of the thermal print head will be liable to damages due to over heat.
- If the voltage is too low ; thin horizontal lines cannot to reproduced clearly.

TPH VOLTAGE SETTING TABLE

RESISTANCE VALUE (Ω)	VOLTAGE (V)
1700 ~ 1713	11.4
1714 ~ 1743	11.5
1744 ~ 1774	11.6
1775 ~ 1804	11.7
1805 ~ 1835	11.8
1836 ~ 1866	11.9
1867 ~ 1897	12.0
1898 ~ 1929	12.1
1930 ~ 1961	12.2
1962 ~ 1993	12.3
1994 ~ 2026	12.4
2027 ~ 2058	12.5
2059 ~ 2091	12.6
2092 ~ 2124	12.7
2125 ~ 2158	12.8
2159 ~ 2192	12.9
2193 ~ 2226	13.0
2227 ~ 2260	13.1
2261 ~ 2294	13.2
2295 ~ 2300	13.3

5. MASTER CLAMP & LOADING SECTION

CONTENTS

[Theory of Operation]
1. Clamp Unit Home Positioning System 5-1
2. Clamp Plate Master Release System 5-2
3. Clamp Plate Master Clamp System 5-4

[Removal]
1. Clamp Unit 5-6
2. Disassembling of Clamp Unit 5-7
3. Angle Sensor Ass'y 5-8

LED DRMO Lit up when 0° angular sensor detects magnet.
DRM1 Lit up when 180° angular sensor detects magnet.

1. THEORY OF OPERATION

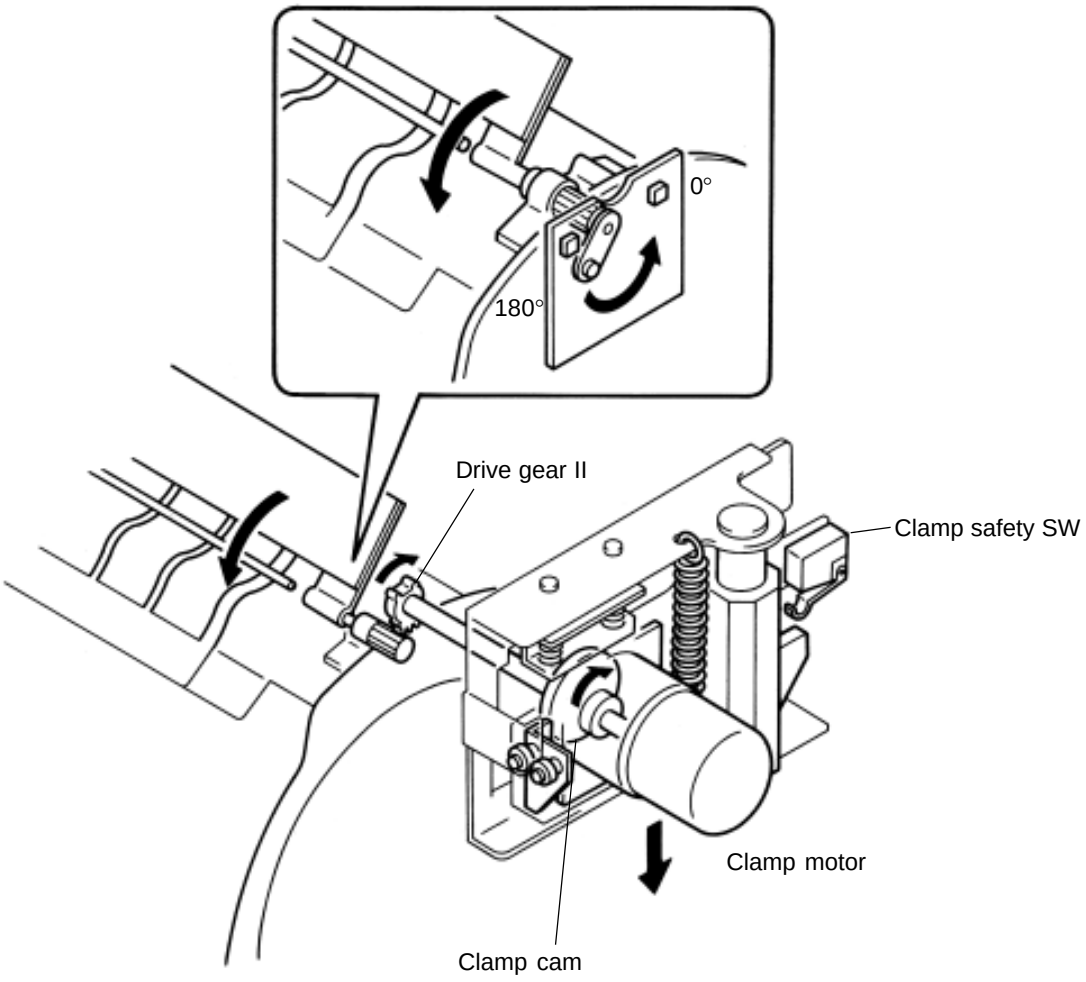
1. CLAMP UNIT HOME POSITIONING SYSTEM

When the clamp unit is held lowered in Power ON or All Reset state (when the clamp safety SW has not been pushed), perform the following clamp unit home position returning to raise the clamp unit.

1. When both 0° and 180° angular sensors are held OFF:
The clamp motor is turned ON in “close” direction until the clamp plate is closed, the 0° angular sensor is turned ON, the clamp unit is raised and Clamp Safety SW is pushed.

2. When 0° angular sensor is held ON:
The clamp motor is turned ON in “open” direction until the clamp plate is opened, the 180° angular sensor is turned ON, the clamp unit is raised, and Clamp Safty Sw is pressed.

3. When 180° angular sensor is held ON:
The clamp motor is turned ON in “close” direction until the clamp board is closed, the 0° angular sensor is turned ON, the clamp unit is raised, and Clamp Safety SW is pressed.



LED DRM1 Lit up when 180° angular sensor detects magnet.

2. CLAMP PLATE MASTER RELEASE SYSTEM

<START> key ON

↓

Clamp motor gets ON in "open" direction and clamp plate starts to open.

↓

Clamp unit lowers, detaching Clamp Safety SW. — When Clamp Safety SW is kept pushed, "T14".

↓

Clamp plate opens, turning ON 180° angular sensor. — When 180° angular sensor does not get ON, "T14".

↓

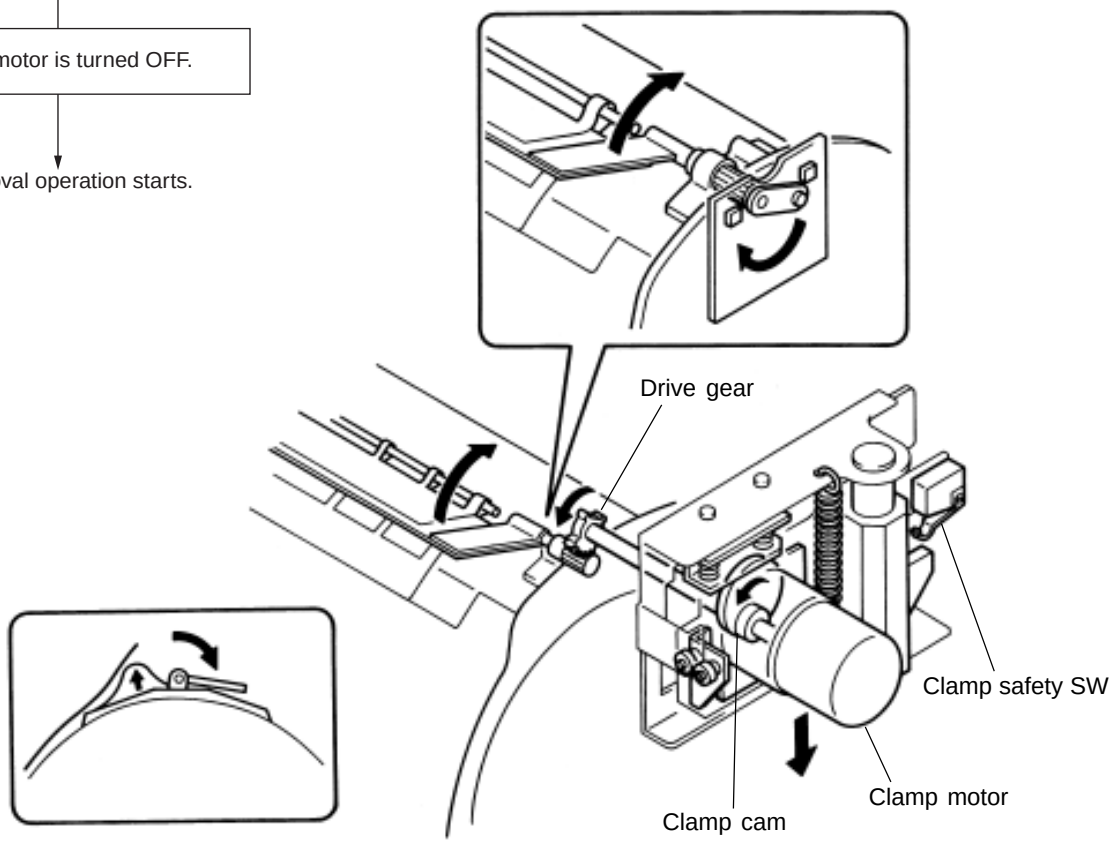
Clamp unit is raised, pushing Clamp Safety SW. — When Clamp Safety Sw is not pushed, "T14".

↓

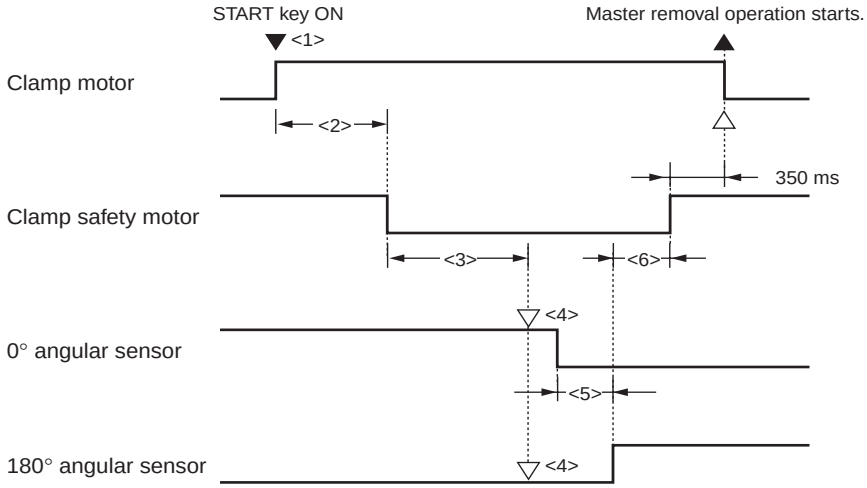
Clamp motor is turned OFF.

↓

Master removal operation starts.



TIMING CHART OF CLAMP PLATE OPENING OPERATION



<1> When A detection sensor is not ON, start operation after A detection of the drum is performed.
<2> When Clamp Safety SW is kept pushed for a period longer than 1.5 seconds from turning ON of the clamp motor, a clamp error is judged and “T14 CALL SERVICE” appears.
<3> When the 0° angular sensor and the 180° angular sensor are both held OFF or ON for a period longer than 1.5 seconds after Clamp Safety Sw is released, a clamp error is judged and “T3 CALL SERVICE” message appears.
<4> When the 180° angular sensor does not get ON even after 2 seconds from turning OFF of the 0° angular sensor, a clamp error is judged and “T14 CALL SERVICE” appears.
<5> When Clamp Safety SW is not pushed even after 2 seconds from turning ON of the 180° angular sensor, a clamp error is judged and “T14 CALL SERVICE” appears.

T3 (Clamp Error (1))
• Both 0° angular sensor and 180° angular sensor are turned OFF or ON.

T14 (Clamp Error (2))
• Clamp Safety SW kept pushed. • The 180° angular sensor not turned ON. • Clamp Safety SW not pushed.

LED DRM0 Lit up when 0° angular sensor detects magnet.

3. CLAMP PLATE MASTER SYSTEM

Master is fed on to drum

↓

Clamp motor ON in "close" direction and clamp plate starts to close.

↓

Clamp unit lowers and Clamp Safety SW is detached.

When Clamp Safety SW is kept pushed, "T14".

↓

Clamp plate close, turning ON 0° angular sensor.

When 0° angular sensor does not get ON, "T14".

↓

Clamp unit goes up, pushing Clamp Safety SW.

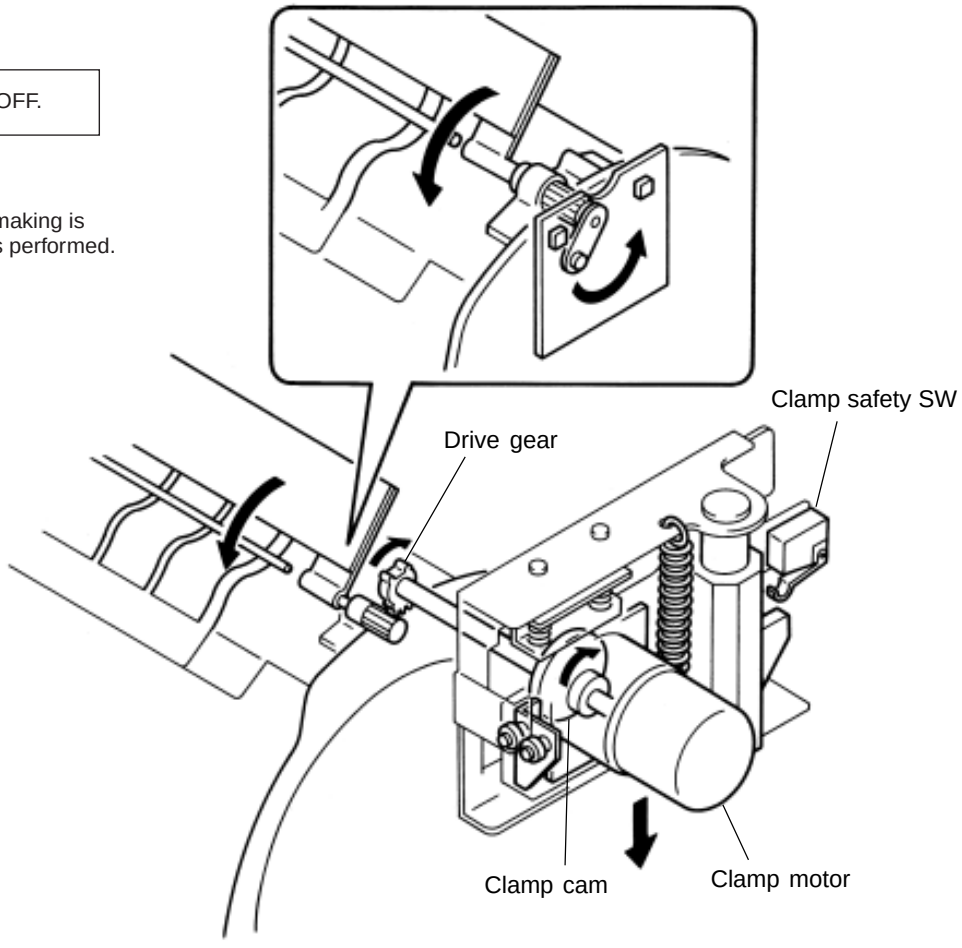
When Clamp Safety SW is not pushed, "T14".

↓

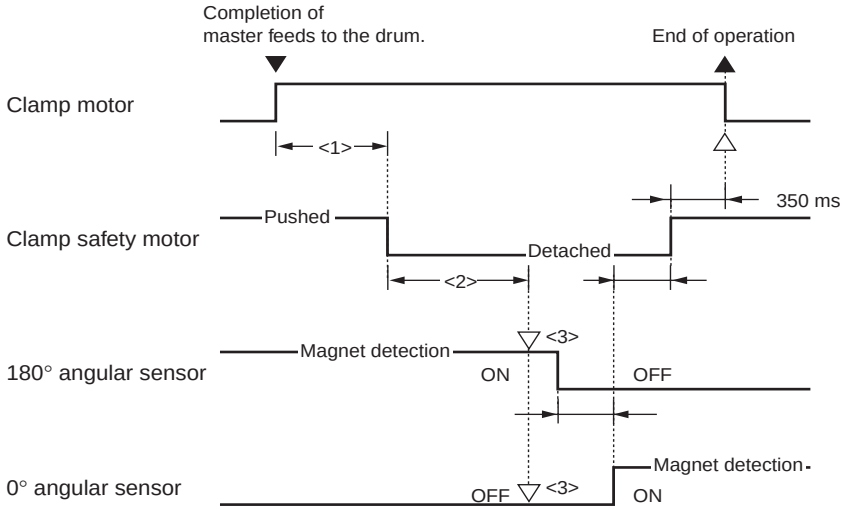
Clamp motor is turned OFF.

↓

After completion of master-making is confirmed, master loading is performed.



TIMING CHART OF CLAMP PLATE CLOSING OPERATION



<1> When Clamp Safety SW is kept pushed for a period longer than 1.5 seconds from turning ON of the clamp motor, a clamp error is judged and “T14 CALL SERVICE” appears.
<2> When the 0° angular sensor and the 180° angular sensor are both held OFF or ON for a period longer than 1.5 seconds after Clamp Safety SW is released, “T3 CALL SERVICE” message appears.
<3> When the 0° angular sensor does not get ON even after 2 seconds from turning OFF of the 180° angular sensor, a clamp error is judged and “T14 CALL SERVICE” message appears.
<4> When Clamp Safety Sw is not pushed even after 2 seconds from turning ON of the 0° angular sensor, a clamp error is judged and “T14 CALL SERVICE” message appears.

T3 (Clamp Error (1))
• Both 0° angular sensor and 180° angular sensor are turned OFF or ON.

T14 (Clamp Error (2))
• Clamp Safety SW kept pushed. • The 0 ° angular sensor not turned ON. • Clamp Safety SW not pushed.

2. REMOVAL

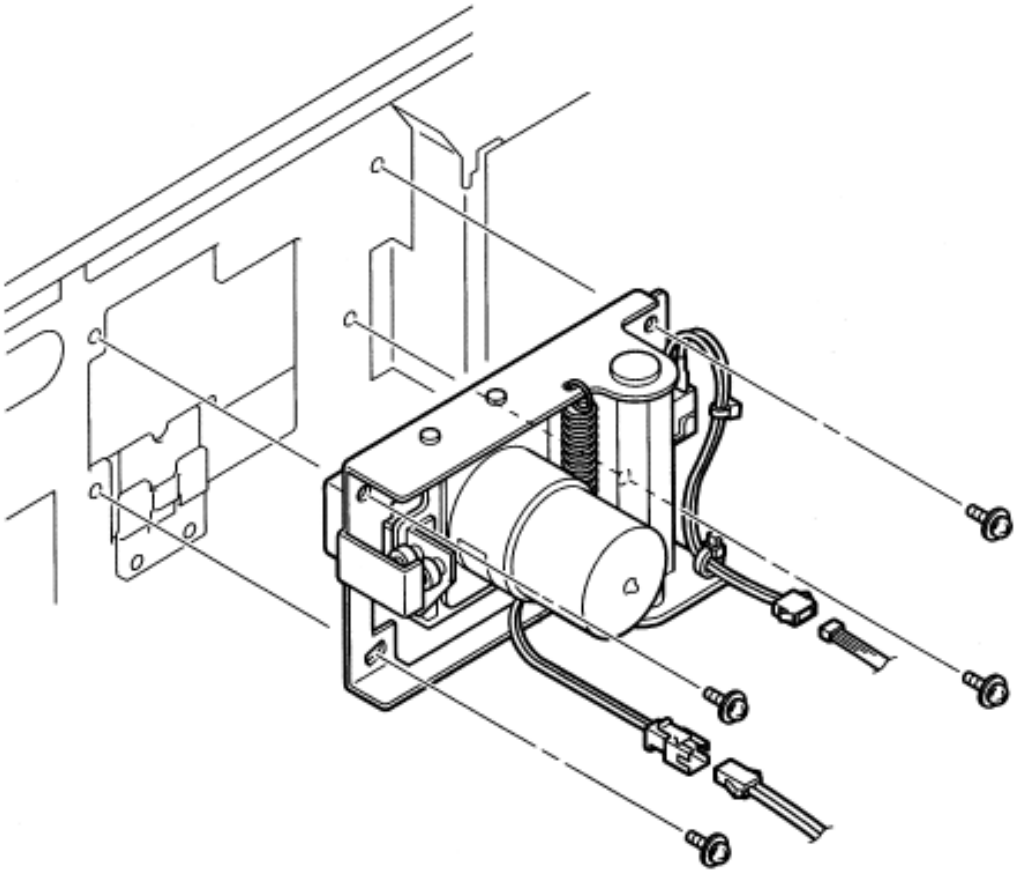
1. CLAMP UNIT

REMOVAL

1) Turn off the power and remove the back cover.
2) Disconnect connectors of the clamp motor and Clamp Safety SW.
3) Remove mounting screws (× 4) of the clamp unit, remove the unit.

- Precaution in Assembly -

• Be sure to use fixing screws of M4 × 6 (short screw). (A long screw, if used, can hit the drum.)

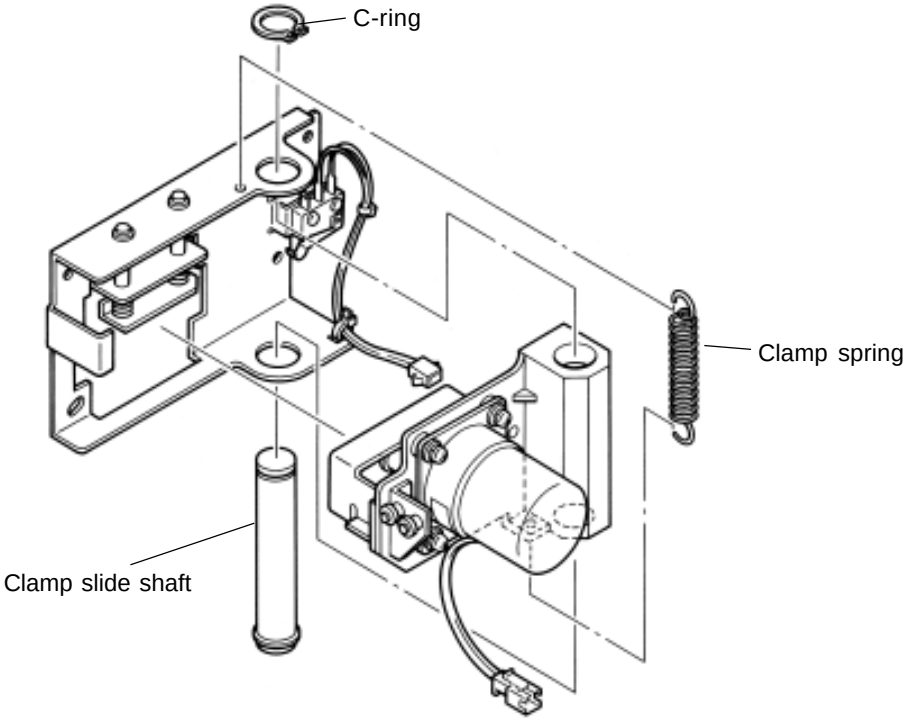


Pan-head Screw SW. W

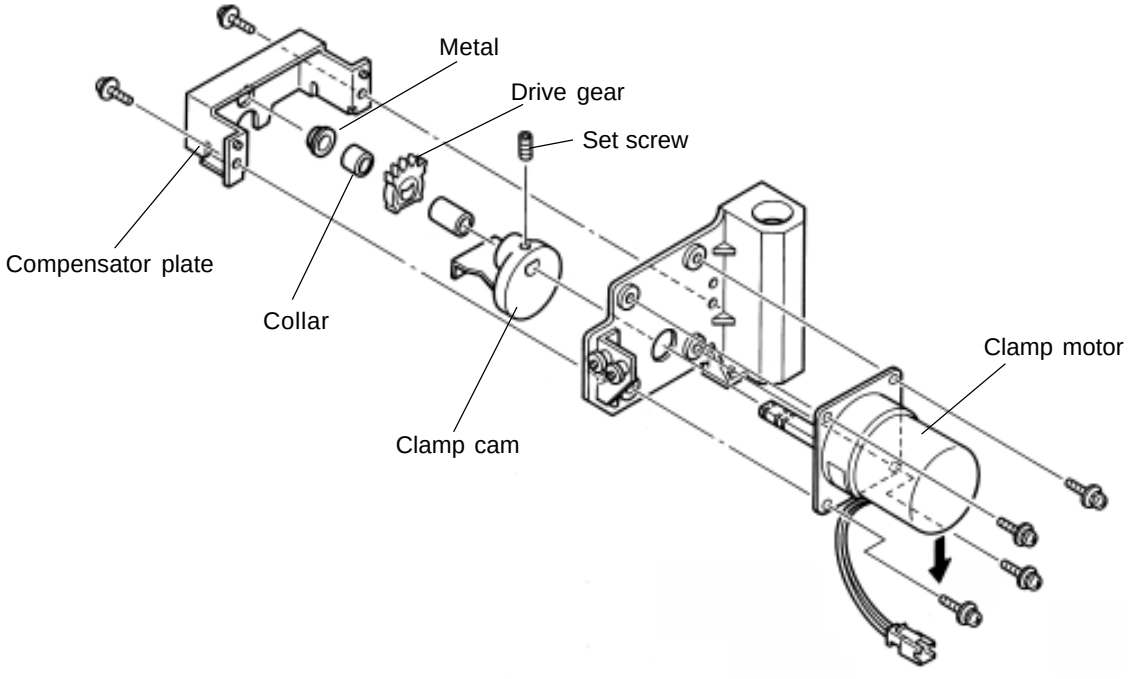
2. DISASSEMBLING OF CLAMP UNIT

DISASSEMBLY

1) Remove the clamp spring.
2) Detaching the C-ring (× 1) fixing the clamp slide shaft, remove the motor unit.



3) Remove mounting screws (× 2) of Compensator Plate, remove the compensator plate, the metal, the collar (short), Drive Gear II, and the collar (long).
4) Loosening the fixing set screw of the clamp cam, remove the cam.
5) Remove mounting screws (× 4) of the clamp motor remove the motor.



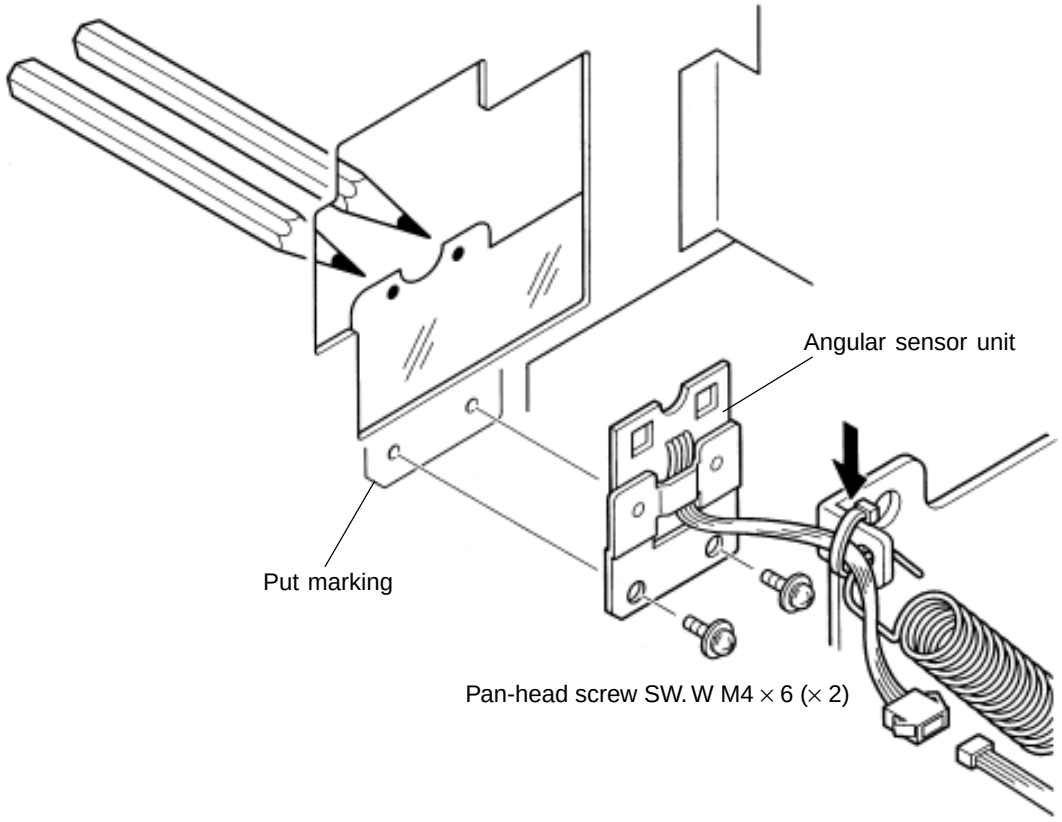
3. ANGLE SENSOR ASSY.

REMOVAL

1) Pull out the drum, turn off the power and remove the back cover.
2) Before taking off the angular sensor, put a mark in the sensor fitting position so that place for fitting is clearly known.
3) Disconnect the angular sensor connector, remove fixing screws (× 2) of the angular sensor and take off the sensor.

- Precaution in Assembly -

- Be sure to use fixing screws of M4 × 6(shorter screw). (A long screw, if used, can hit the drum.)
- Mounting it back to the initial place as referring to the marking, confirm that the angular sensor performs detection when the clamp plate is closed and opened.



APPENDIX (I)

CONTENTS

1. Test Mode

1. Operation Procedures ..... APX(I)-1
2. Testing Sensor and Switch ..... APX(I)-3
3. Testing Motor and Solenoid ..... APX(I)-4
4. Memory Switch ..... APX(I)-5
5. Memory Clear and Counter Stop, etc. ..... APX(I)-7
6. Sequential Operation Test ..... APX(I)-8
7. Panel Test ..... APX(I)-10

2. Advice Displays

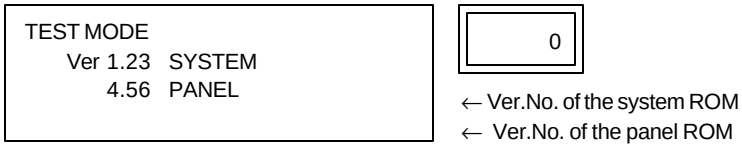
1. Trouble Messages (T Display) ..... APX(I)-11
2. Trouble Messages (Others) ..... APX(I)-15
3. Setting Confirmation Messages ..... APX(I)-18
4. Change-of-Consumables Messages ..... APX(I)-19

1. TEST MODE

1. OPERATION PROCEDURES

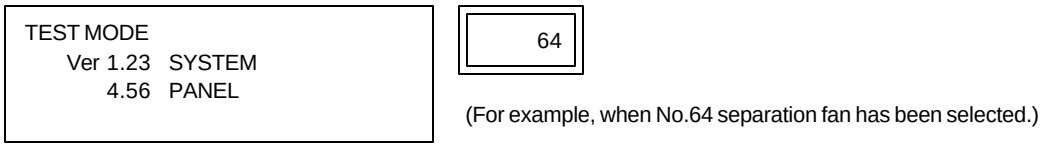
(1) Starting Up Test mode

Turn on the power, pressing down both <M/P> and <LINE/PHOTO> buttons on the main panel.



(2) HOW TO OPERATE

<1> Input a test mode No. by using panel-keys.



<2> Press <START> key to start operation.

<3> Press <START> key one more time to stop operation.

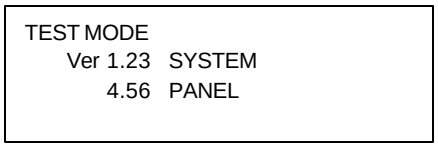
<4> To select another Test mode, clear the set Test No. by pressing the <C> or <STOP> button and select another Test No.

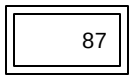
(3) Exiting from the Test mode

To exit from a Test mode, clear the set Test No. by pressing the <C> or <STOP> button and then press the <ALL RESET> button.

(4) HOW TO OPERATE TEST MODE NO'S 81 TO 89, 121, AND 122 (MEMORY SW'S)

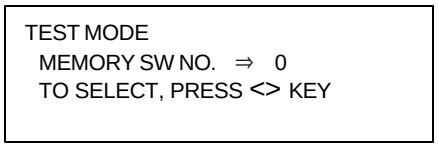
<1> Starting Test mode, input a Test mode No. and press <START> key.

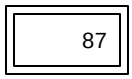




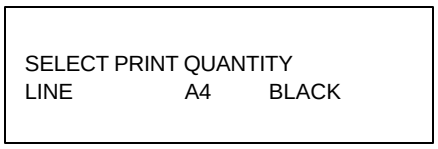
(For example, when scanning start Position Adjustment has been selected)

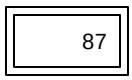
<2> To change the Memory switch setting, press the < or > key of the PRINT POSITION BUTTON to more the number up or down.





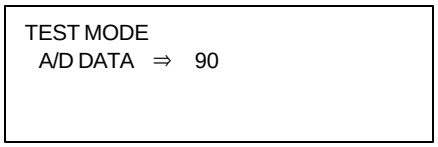
<3> To set the machine at the selected switch setting, press the <START> button and then <C> or <STOP> button and then <ALL RESET> button to exit from the Memory Switch adjustment.

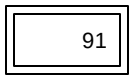




(5) TEST MODE NO. 91 (Master Marking Width check)

<1> Starting Test mode, input Test Mode No.91 and press <START> key.



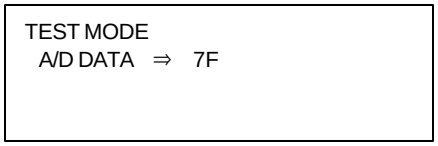


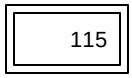
(Display changes according to fence width of the feed tray. Flickering of display does not cause any problem.)

<2> Press <STOP> key to return to the normal working condition.

(6) TEST MODE NO'S 115 AND 116 (THERMISTOR CHECK)

<1> Starting Test mode, input Test Mode No.115 (Ink thermistor check) or No.116 (TPH thermister check) and press <START> key.





(Flickering of display does not cause any problem. Display "00" or "FF", if appearing, indicates thermistor failure.)

2. TESTING SENSOR AND SWITCH

The current states of sensors and switches are indicated with buzzer sound:
Detection : 0.1 second interval beep
No detection : 0.5 second interval beep

No.	Test Component	Detection Status	Remarks
1	Paper detection sensor	Reflected light is detected (for paper provided.)	Applicable only to Model 600dpi.
2	Paper size sensor	Reflected light is detected (for paper provided.)	
3	Elevator lower limit sensor	Light path is blocked (at lower limit)	
4	Paper feed pressure switch	The switch is released (for standard level.)	
5	Master loading button	This button is pressed.	
6	Paper sensor	Light path is blocked (for paper provided.)	
7	Pressure detection sensor	Light path is blocked (for disc provided.)	
8	Position A sensor	Light path is blocked.	
9	0° angular sensor	Magnetism is detected	
10	180° angular sensor	Magnetism is detected	
11	Position C sensor	Light path is blocked.	
12	Feed-tray down button	This button is pressed.	
13	Clamp safety switch	This switch is pressed (for standby position.)	
14	Master removal hook sensor	Light path is blocked.	
15	Master positioning sensor	Reflected light is detected.	
16	Drum home position button	This button is pressed.	
17	Ink bottle SW-HD	This switch is pressed.	Model 600dpi.
18	Drum set switch	This switch is pressed (for setting.)	
19	Paper receiving sensor 1	Light path is blocked (for paper provided.)	
20	Paper receiving sensor 2	Light path is blocked (for paper provided.)	
21	Scanner table set switch	This switch is pressed (for closure.)	Applicable only to Model FB.
21	Upper cover setting switch	This switch is pressed (for closure.)	Only to sheet type.
22	Vertical centering sensor	Light path is blocked.	
23	Master end sensor	Light path is blocked (for end tape provided.)	
24	Paper feed clutch sensor	Light path is blocked.	
25	Paper feed det sensor	Light path is blocked (for paper provided.)	
26	Jump wing switch 1	This switch is pressed.	
27	Jump wing switch 2	This switch is pressed.	
28	Master removal sensor	Light path is blocked (for master provided.)	
29	Master loading unit switch	This switch is pressed (for closure.)	
30	Front cover set senser	Metal plate is detected (for closure.)	
31	TPH home position switch	This switch is pressed.	
32	TPH pressure switch	This switch is pressed.	
33	Disposal box set switch	This switch is pressed (for setting.)	
34	ADF original detection sensor	This sensor is operated (for original provided.)	Applicable only to ADF unit mounting type.
35	Original registration sensor	This sensor is operated (for original provided.)	Applicable only to ADF unit mounting type.
36	Original IN sensor	Light path is blocked (for original provided.)	Applicable only to ADF unit mounting type.
37	Ink sensor	Ink is detected.	
38	Overflow sensor	Ink is detected.	
39	Main motor interlock switch	This switch is pressed	
40	Paper feed safety switch	This switch is detached (for any abnormality occurrence.)	

No.	Test Component	Detection Status	Remarks
41	Paper feed cassette sensor 1	Magnetism is detected.	
42	Paper feed cassette sensor 2	Magnetism is detected.	
43	Paper feed cassette sensor 3	Magnetism is detected.	
44	Paper feed cassette sensor 4	Magnetism is detected.	
45	Original OUT sensor	This sensor is operated (for original provided.)	Only to ADF unit mounting type.
46	ADF switch	This switch is pressed.	Only to ADF unit mounting type.
47	Master detection sensor	Reflected light detected (for master provided.)	
48	Master loading sensor	Reflected light detected (for master provided.)	
49	Scanner home position sensor	Light path is blocked.	Only to FB type.
50	Scanner ADF shading sensor	Light path is blocked.	Only to FB type.
51	Stage cover sensor	Light path is blocked (for closure.)	Only to FB type.
52	FB original detection sensor	Reflected light detected (for original provided.)	Only to FB type.
53	Pressure control sensor	Light path is blocked (for metal plate provided.)	
54	Disposal box master sensor (Master removal detection sensor)	Light path is blocked (for master provided.)	
55	Bottle set switch 1	This switch is pressed.	
56	Bottle set switch 2	This switch is pressed.	
57	Bottle set switch 3	This switch is pressed.	
58	Battery detection signal	Battery is provided.	
59	Option PCB detection signal	Option PCB is provided.	

3. TESTING MOTOR AND SOLENOID

Every pushing of <START> key turns the following ON/OFF:

No.	Test Item	Remarks
60	15rpm drum rotation	Main motor safety SW has to be held pressed.
61	30 rpm drum rotation	No.62 serves as <Print Speed Adj.> key to vary speed.
62	Variable speed drum rotation	
63	Unused	
64	Separation fan	
65	Write pulse motor	
66	Loading pulse motor	
67	Paper feed clutch	Paper feed clutch sensor is held ON and Stack paper feed SW OFF.
68	Pressure solenoid	
69	Suction fan	
70	Master removal fan	
71	Master removal vertical transport motor	
71	Master removal solenoid	
72	Loading fan	
73	Clamp solenoid	Applicable only to 300/400dpi types.
73	Lock solenoid	Only to 600dpi type.
74	Lock solenoid	Only to 300/400dpi type.
74	Clamp motor open direction	Only to 600dpi type. Pull out Drum.
75	Clamp motor close direction	Only to 600dpi type. Pull out Drum.
76	Original pickup solenoid	Only to ADF unit mounting type.
77	Thermal power control	
78	Original pickup motor	Only to ADF unit mounting type.
79	Image scanner LED lighting	
80	Wing motor	

4. MEMORY SWITCH

Various kinds of setting concerning master making, etc. are stored in Memory switches. Use <Print Position Adjust> key to change setting.

No.	DETAILS OF MEMORY SW
81	**Image Scanner ADF Home Position Adjustment** (This applies only to 300/400dpi type.) Adjusts the position of the Image scanner against the White roller (Read roller) to sharpen the blurred image caused by incorrect positioning of the Image scanner.

Memory SW	9	A	B	C	D	E	F	O	
Change Volume mm	–1.4	–1.2	–1.0	–0.8	–0.6	–0.4	–0.2	0.0	
	0	1	2	3	4	5	6	7	8
	0.0	+0.2	+0.4	+0.6	+0.8	+1.0	+1.2	+1.4	+1.6

82	**Scanning Start Position Adjustment (Book processing mode)** (This applies only to 300/400dpi.) (Adjusts the distance between ADF shading sensor position and original reading start position.)

Memory SW	9	A	B	C	D	E	F	O	
Change Volume mm	–1.4	–1.2	–1.0	–0.8	–0.6	–0.4	–0.2	0.0	
	0	1	2	3	4	5	6	7	8
	0.0	+0.2	+0.4	+0.6	+0.8	+1.0	+1.2	+1.4	+1.6

< Increased Skipping volume Decreased >

83	**Horizontal Scanning Position Adjustment (ADF)** (Adjusts, with the image scanner, the horizontal position for reading of original.)

Memory SW	9	A	B	C	D	E	F	O	
Change Volume mm	–3.5	–3.0	–2.5	–2.0	–1.5	–1.0	–0.5	0.0	
	0	1	2	3	4	5	6	7	8
	0.0	+0.5	+1.0	+1.5	+2.0	+2.5	+3.0	+3.5	+4.0

← Shifted leftward — Reading position — Shifted rightward →

< Shifted rightward (Print Section) Shifted leftward. >

84	**Horizontal Scanning Position Adjustment (FB)** (Adjusts, with the image scanner, the horizontal position for reading of original.)

Memory SW	9	A	B	C	D	E	F	O	
Change Volume mm	–3.5	–3.0	–2.5	–2.0	–1.5	–1.0	–0.5	0.0	
	0	1	2	3	4	5	6	7	8
	0.0	+0.5	+1.0	+1.5	+2.0	+2.5	+3.0	+3.5	+4.0

← Shifted leftward — Reading position — Shifted rightward →

← Shifted rightward — (Print Section) — Shifted leftward. →

No.	DETAILS OF MEMORY SW
85	**Master Marking lenght (Write Pulse Motor Operation Time) Adjustment (Except 600dpi type)** Adjusts the master making length by controlling the operation time of the Write pulse motor.

Memory SW	9	A	B	C	D	E	F	O	
Change Volume mm	–3.5	–3.0	–2.5	–2.0	–1.5	–1.0	–0.5	0.0	
	0	1	2	3	4	5	6	7	8
	0.0	+0.5	+1.0	+1.5	+2.0	+2.5	+3.0	+3.5	+4.0

← Increased — Master making cut volume — Decreased →

No.	DETAILS OF MEMORY SW
86	**Scanning Start Position Adjustment (ADF)** (Adjusts feed volume from the ADF original IN sensor in original set operation.)

Memory SW	9	A	B	C	D	E	F	O	
Change Volume mm	–2.8	–2.4	–2.0	–1.6	–1.2	–0.8	–0.4	0.0	
	0	1	2	3	4	5	6	7	8
	0.0	+0.4	+0.8	+1.2	+1.6	+2.0	+2.4	+2.8	+3.2

< Decreased — Read skip volume — Increased >

No.	DETAILS OF MEMORY SW
87	**Scanning Start Position Adjustment (FB)** (Adjusts distance from FB/HP sensor position to reading start position.)

Memory SW	9	A	B	C	D	E	F	O	
Change Volume mm	–2.8	–2.4	–2.0	–1.6	–1.2	–0.8	–0.4	0.0	
	0	1	2	3	4	5	6	7	8
	0.0	+0.4	+0.8	+1.2	+1.6	+2.0	+2.4	+2.8	+3.2

< Decreased — Read skip volume — Increased >

No.	DETAILS OF MEMORY SW
88	**TPH Thermal Power Adjustment (Except 600dpi type)** (Sets energy applied to thermal print head.)

Memory SW	0	1	2	3	4
Energy %	100 %	105 %	95 %	90 %	85 %

No.	DETAILS OF MEMORY SW
89	**Separation Fan Air Power Adjustment**

Memory SW	0	1	2
Power Supply Time %	100 %	50 %	30 %

<table>
<tr><th>No.</th><th>DETAILS OF MEMORY SW</th></tr>
<tr><td>121</td><td>Setting of original scanning density default (FB type)
(Initial setting of original scanning density on starting.)
<table><tr><td>Memory SW</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Default</td><td>Auto</td><td>Manual 3</td><td>Manual 4</td><td>Power OFF state</td></tr></table></td></tr>
<tr><td>122</td><td>Setting of sheet no. return on switching of Master Making mode
(Sets sheet no. return when mode has been switched to Master Making while in printing.)
<table><tr><td>Memory SW</td><td>0</td><td>1</td></tr><tr><td>Details</td><td>Sheet no. return</td><td>Sheet no. not returned</td></tr></table></td></tr>
</table>

5. Memory Clear and Counter Stop, etc.

<table>
<tr><th>No.</th><th>Details of Test Mode</th></tr>
<tr><td>90</td><td>Partial Memory Clear
Certain portion of RAM contents in the System PCB, such as Jam and Trouble messages, will be initialized.
(The same operation as when turning the power ON while pressing All Reset button.)</td></tr>
<tr><td>91</td><td>Master Marking Width Ceck (Except for GR1700)</td></tr>
<tr><td>92</td><td>Prevention of the following operations: master and copy counting, Key/card counter and “T17 CALL SERVICE” or [E17] error signal display (for dead battery)
• In normal operation, the Master count and Copy count signals will not be output, allowing a service technician to print without increasing the digit of the Master and Copy counters.
• The machine will be released from this condition when the power is turned off.
[CAUTION]
Do not use this mode when TM5000 is in connection.</td></tr>
<tr><td>97</td><td>All Memory Clear
All RAM contents in the System PCBs, excluding Memory switch setting by Test modes, that is No.81 through 87, will be initialized. Master disposal count is not cleared.
NOTE: This test mode must be done each time System ROM, System PCB, or Battery is changed.</td></tr>
<tr><td>98</td><td>Memory Switch Clear
Memory switch settings by Test modes No.81 through 87 will be initialized.
This test mode must be done each time System PCB is changed.
[CAUTION]
<u>Do not use this test mode in normal operation.</u>
<u>All the programmed Memory switch settings in the machine will be initialized.</u></td></tr>
</table>

6. SEQUENTIAL OPERATION TEST

No.	Details of Test Mode
101	**Ink supply operation** Until the ink sensor gets ON, the main motor and the ink motor are held ON. Ink sensor ON ⇒ confidential op. ⇒ press application × 30 times ⇒ Stopped on A detection position. (For FB type, further, the image scanner shuttles between the Image Scanner home position sensor and the ADF shading sensor at a speed of 50%.)
102	**Elevator operation** Operation starts when the feed tray DOWN button is pressed. UP ⇒ Elevator upper limit sensor ON ⇒ stop Upper limit position ⇒ DOWN ⇒ elevator lower limit sensor ON ⇒ stop Operation stops when the feed tray DOWN button is released.
103	**Print positioning motor operation** (one-cycle) (This applies only to 300/400dpi types.) Return to Vertical center position ⇒ one second halt ⇒ downward rotation ⇒ one second halt ⇒ upward rotation ⇒ one second halt ⇒ return to vertical center ⇒ stop
104	**Clamp open/close continuous operation** Rotate Drum to Home position ⇒ clamp plate opened ⇒ one second halt ⇒ clamp plate closed ⇒ Rotate Drum to Home position ⇒ clamp plate opened
105	**ADF Original feed operation** ADF original det. sensor turned ON ⇒ original setting operation ⇒ read-in operation ⇒ ADF original det. sensor turned ON ⇒ original setting operation ...
105	**Image Observation mode** (factory use) (This applies only to 600dpi.)
106	**Confidential 3-cycle operation** (This applies only to 300/400dpi types) Confidential op. ⇒ press op. ⇒ drum rotated by 5 times ⇒ confidential op. ⇒ .....⇒ stop
107	**Printing continuous operation** (This applies only to 300/400dpi types.) Neither copy counting nor paper jam detection is performed. Speed changing, feed tray lowering for paper shortage, inking operation, and pressure changing are performed.
107	**Ink-free printing operation** (This applies only to 600dpi type.) Continuous printing is performed without inking.
108	**Flat bed read pulse motor (image sensor) continuous operation** (speed at 100%) Image Scanner home position sensor position (2 seconds halt) ⇒ rightward shift ⇒ ADF shading sensor position (2 sec. halt) ⇒ rightward shift ⇒ ADF read-in position (2 sec. halt) ⇒ leftward shift ⇒ Image Scanner home position sensor position (2 sec. halt) ⇒ rightward shift ⇒ .....
109	**Machine aging operation** Drum rotation at 3000 times ⇒ Stop at A detection
110	**Elevator aging operation** (This applies only to 300/400 dpi types.) UP ⇒ elevator upper limit sensor ON ⇒ stop ⇒ DOWN ⇒ elevator lower limit sensor ON ⇒ stop ⇒ UP ⇒ ×5000 ⇒ stop

<table>
<tr><th>No.</th><th>Details of Test Mode</th></tr>
<tr><td>111</td><td>Thermal pressure motor operation
When TPH home position SW is ON:
DOWN ⇒ TPH pressure SW ON ⇒ stop
When TPH pressure SW is ON:
UP ⇒ TPH home position SW ON ⇒ stop</td></tr>
<tr><td>112</td><td>Cutter motor one-cut operation</td></tr>
<tr><td>113</td><td>FB type ADF original feed operation (Image scanner does not operate.)
ADF original det. sensor ON ⇒ ADF original setting ⇒ ADF read-in operation
⇒ ADF original det. sensor ON ⇒ ADF original setting ...</td></tr>
<tr><td>114</td><td>Pressure changing operation (This applies only to 300/400dpi types.)
Set to initial level ⇒ one second halt ⇒ shifted to Level 23 ⇒ shifted to Level 1
⇒ set to initial level ⇒ × 3 times ⇒ stop</td></tr>
<tr><td>115</td><td>Ink thermistor AD value display</td></tr>
<tr><td>116</td><td>TPH thermistor AD value display</td></tr>
<tr><td>117</td><td>Thermal print head check operation 1
Makes a master of Test Pattern 1 memorized inside the image processing PCB.</td></tr>
<tr><td>118</td><td>Thermal print head check operation 2
Makes a master of Test Pattern 2 memorized inside the image processing PCB.</td></tr>
<tr><td>119</td><td>Thermal print head check operation 3 (checkered)
Makes a master of Test Pattern 3 memorized inside the image processing PCB.</td></tr>
<tr><td>120</td><td>Thermal print head check operation 4 (checkered)
Makes a master of Test Pattern 4 memorized inside the image processing PCB.</td></tr>
<tr><td>121</td><td>Original Scanning density default setting (Memory SW)
(Initial setting of original Scanning density on starting)
<table><tr><td>Memory SW</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Default</td><td>Auto</td><td>Manual 3</td><td>Manual 4</td><td>Power OFF state</td></tr></table></td></tr>
<tr><td>122</td><td>Setting of sheet no. return on Master Making mode switching (Memory SW)
(Sets sheet no. return when mode has been switched to Master Making while in printing.)
<table><tr><td>Memory SW</td><td>0</td><td>1</td></tr><tr><td>Details</td><td>Sheet no. return</td><td>Sheet no. not returned</td></tr></table></td></tr>
<tr><td>131</td><td>Suction clutch operation
Main motor rotates at 15rpm.
Every pushing of <*> key turns ON/OFF the suction clutch.</td></tr>
<tr><td>132</td><td>Image Scanner Fix mode (Set) (This applies only to 600dpi type.)
Prior to delivery, the image Scanner is shifted to the fixed position where its operation is stopped.</td></tr>
<tr><td>133</td><td>Image Scanner Release mode (Reset) (This applies only to 600dpi type.)
On unpacking, image Scanner fixing parts are removed and Test mode is executed.
Image Scanner Fix mode is cancelled and the image Scanner is shifted to the home position.</td></tr>
<tr><td>135</td><td>Clamp Unit Initial Operation (This applies only to 600dpi type.)</td></tr>
<tr><td>136</td><td>Clamp plate opening operation (This applies only to 600dpi type.)
Clamp plate is opened when the 0° angular sensor is ON.</td></tr>
</table>

No.	Details of Test Mode
137	**Clamp plate closing operation** (This applies only to 600dpi type.) Clamp plate is closed when the 180° angular sensor is ON.
139	**Sorter Initial Communication mode** (This applies only to 600dpi type.) Following connecting to the sorter, perform initial communication with the sorter to enable its use.

7. PANEL TEST

No.	Details of Test Mode
200	**Panel LCD test display** (Factory use) Panel message is displayed on LCD.
201	**Panel LED test lighting** (Factory use) All LED's on the panel are lit up.
202	**Panel key check** (Factory use) Name of the pushed key on the panel is displayed on LCD.

2. ADVICE DISPLAYS

1. TROUBLE MESSAGES (T DISPLAY)

Display	Details	How to Cancel
T1 CALL SERVICE ⇓ TO RESUME OPERATION PRESS START KEY (while in master making.)	**Main Motor Lock** • In 3 seconds from turning ON of the main motor, the A detection sensor light path is still held blocked. • In 8 seconds from turning ON of the main motor, the A detection sensor is not blocked. • When the fuse of the power supply PCB is gone.	Press <ALL RESET> key. ⇓ Press <START> key.
T2 CALL SERVICE	**Elevator Motor Lock** • In 15 seconds from turning ON of the elevator motor in upward direction, the elevator upper limit sensor is not pushed. • In 15 seconds from turning ON of the elevator motor in downward direction, the light path of the elevator lower limit sensor is not blocked. • In 3 seconds from turning ON of the elevator motor in upward direction, the elevator lower sensor is held blocked. • In 3 seconds from turning ON of the elevator motor in downward direction, the elevator upper limit sensor is held pressed down. • When the fuse of the power supply PCB is gone.	Press <ALL RESET> key.
T3 CALL SERVICE ⇓ TO RESUME OPERATION PRESS START KEY.	**Clamp Error (1)** (300/400dpi types) • In 4 seconds from turning ON of the clamp solenoid in clamp retrial, the clamp safety switch is held still pressed down. • In 4 seconds from turning OFF of the clamp solenoid, the clamp safety SW has not been pressed. • In 8 seconds from turning ON of the clamp motor in opening direction in clamp retrial, the 180° angular sensor has not detected magnet. • In 8 seconds from turning ON of the clamp motor in closing direction in clamp retrial, the 0° angular sensor has not detected magnet. * In any of the above cases, master making is performed to the end.	Press <ALL RESET> key. ⇓ Press <START> key.
T3 CALL SERVICE ⇓ TO RESUME OPERATION PRESS START KEY.	**Clamp Error (1)** (600dpi type) • In 1.5 seconds after the clamp motor is turned ON and the clamp safety SW is detached, both the 0° and 180° angular sensors are held in OFF or ON state. * Master making is performed to the end.	Press <ALL RESET> key. ⇓ Press <START> key.
T4 CALL SERVICE	**Overflow** • When ink is in contact with the overflow sensor. The drum set switch need be pushed.	Overflow sensor OFF <CLEAN>

Display	Details	How to Cancel
T5 CALL SERVICE	**Print Positioning Motor Lock** • In 12 seconds from turning ON of the print positioning motor, the vertical centering sensor is not turned ON/OFF. • When the fuse of the main power PCB is gone	Press <ALL RESET> key.
T6 CALL SERVICE	**Pressure Detection Sensor Malfunction** • In 8 seconds from turning ON of the main motor, the pressure detection sensor is not turned ON/OFF.	Press <ALL RESET> key.
T7 TURN MAIN POWER SW. OFF THEN ON	**Communication error between GR and Digitizer** • On occurrence of an error in communication between the CPU and Digitizer III.	OFF -> ON
T8 TURN MAIN POWER SW. OFF THEN ON	**Communication error between GR and Interface Accessaries** • On occurrence of an error in communication between the CPU and the interface accessaries.	OFF -> ON
T9 TURN MAIN POWER SW. OFF THEN ON	**Communication error between GR and the Sorters** • On occurrence of an error in communication between the CPU and the sorter (TM)	OFF -> ON
T10 TURN MAIN POWER SW. OFF THEN ON	**Malfunction of Trimming PCB or Image Processing PCB** • When the scanning contrast adjustment signal is not output from the image processing PCB. • When the read start OK signal is not output from the image processing PCB. • When the trimming signal is not output from Trimming PCB.	OFF -> ON
T11 CALL SERVICE	**Pressure Control Motor Lock** • In 100ms from turning ON of the pressure control motor, the encoder sensor cannot detect a pulse. • In 5 seconds from turning ON of the pressure control motor, the pressure centering sensor is not turned ON/OFF. • When the fuse of the main power board is gone.	Press <ALL RESET> key.
T12	Unused.	* * *
T13 CALL SERVICE	**Cutter Motor Lock** • After master cutting retrial with the drum held in C-2 position, when the master positioning sensor is in light-receiving state. (Master cutting has failed in the 2nd time.)	Drawer connector OFF (Pull out the drum.)
T14 CALL SERVICE	**Clamp Error (2)** 300/400dpi type • If the actuator of the clamp safety switch is not depressed when the clamp solenoid is not in operation.	Press <ALL RESET> key.

Display	Details	How to Cancel
T14 CALL SERVICE	**Clamp Error (2)** 600dpi type • In 2 seconds from turning ON of the clamp motor in clamp unit home position return operation, the 0° or 180° angular sensor has not detected magnet. • In 2 seconds after the clamp motor gets ON and the 0° or 180° angular sensor detects magnet in clamp unit home position return operation, the clamp safety SW has not been pushed. • In 3 seconds after reverse rotation of the clamp motor in clamp unit home position return operation, the clamp safety SW has not been pressed. * While in master making operation, the master making is performed to the end.	* * *
T15 CALL SERVICE	**Flat Bed Read Pulse Motor Lock** (300/400dpi type) • If the Image scanner home position sensor does not detect the Image scanner within **18898 pulses** after the Flat bed read pulse motor is activated. • If the Image scanner ADF Shading sensor does not detect the Image scanner within **15748 pulses** after the Flat bed read pulse motor is activated. • If the Image scanner is not release from the Image scanner home position sensor within **314 pulses** after the Flat bed read pulse motor is activated. • If the Image scanner is not released from the Image scanner ADF Shading sensor within **314 pulses** after the Flat bed read pulse motor is activated.	Press <ALL RESET> key.
T15 CALL SERVICE	**FB/R Pulse Motor Lock** (600dpi type) • In a fixed period of time from turning ON of the Flat bed read pulse motor, light path of the home position sensor is not blocked. • In a fixed period of time from turning ON of the Flat bed read pulse motor, the home position sensor does not become light receiving state. • In a fixed period of time from turning ON of the Flat bed read pulse motor, light path of the ADF shading sensor is not blocked. • In a fixed period of time from turning ON of the Flat bed read pulse motor, the ADF shading sensor does not become light receiving state. • When Image Scanner Release mode has not been executed. • When the Image scanner fixing metal has not been removed.	Press <ALL RESET> key.
T16 CALL SERVICE	**Position C Sensor Malfunction** Displayed to interrupt the machine operation: • If the Position C sensor status has not been changed from ON to OFF (or OFF to ON) within **8 seconds** from the start of the Main Motor.	Press <ALL RESET> key.
T17 CALL SERVICE REPLACE BATTERY	**Replace Battery** Displayed to interrupt the machine operation: • If the Battery detection signal is OFF at either of following three cases. <1> when the machine power is turned ON <2> when All reset button is pressed <3> at the end of machine operation.	Power OFF -> ON

Display	Details	How to Cancel
T18 TURN MAIN POWER SW. OFF THEN ON	**Sorter Error** Displayed to interrupt the machine operation: • If an error signal is received from the sorter.	Power OFF -> ON
T19 CALL SERVICE	**Thermal Pressure Motor Lock** Displayed to interrupt the machine operation: • If the TPH Pressure switch has not been depressed within **4 seconds** after the TPH Pressure motor was activated to lower theTPH. • If the TPH Pressure switch has not been released within **4 seconds** after the TPH Pressure motor was activated to raise theTPH.	Press <ALL RESET> key.
T20 CALL SERVICE	**Wing Motor Lock** Displayed to interrupt the machine operation: • If neither of the Jump wing sw1 or sw2 has been depressed within **5 seconds** after the Wing motor was activated. • If neither of the Jump wing sw1 or sw2 has been released within **5 seconds** after the Wing motor was activated.	Press <ALL RESET> key.
T50 CALL SERVICE	**Connect "Copy/Master" Counter** • When the total counter or the master counter has not been connected.	Electromagnetic counter setting signal L (Connect an electromagnetic counter.)
T68 CALL SERVICE	**SF3000 Power Supply Malfunction** • When no power is supplied to the SF3000.	
T78 CALL SERVICE	**Machine Model Selection Error** • When there is no machine type which corresponds to the code having been set in system PCB (SW2).	Following SW setting, power OFF ⇒ ON.

2. TROUBLE MESSAGES (OTHERS)

Display	Details	How to Cancel
CHECK PAPER FEED AREA	• If the safety switch over or under the Paper feed tray is activated.	Press Safety SW. (Remove obstacles.)
PAPER MISFEED CHECK PAPER FEED AREA AND PRESS ALL RESET KEY	**Paper Jam in the First Paper Feed Area** Displayed to interrupt the machine operation: • If the Paper sensor has not detected paper while the Position A sensor detects the A position three times.	Press <ALL RESET> key.
PAPER JAM CHECK PAPER FEED AREA	**Paper Jam in the Second Paper Feed Area** Displayed to interrupt the machine operation: • If the Paper sensor malfunctions. • If the Paper sensor detects paper when the Pressure detection sensor detects the Pressure disc. • If at the Drum A position, the Paper receiving sensor 1 does not detect paper and at the next Drum A position, the Paper sensor detects the paper.	Make either Paper Sensor OFF or Press <ALL RESET> key.
PAPER JAM ON DRUM (PRINT CYLINDER) REMOVE PAPER	**Paper Jam under the Drum** Displayed to interrupt the machine operation: • If the Paper receive sensor 1 does not detect paper at the Drum A position and the Paper sensor does not detect the paper at the next Drum A position.	Drum set SW OFF ⇒ ON or press <ALL RESET> key.
PAPER JAM UNDER DRUM PULL OUT DRUM (PAPER JAM REMOVE PAPER UNDER PRINT CYLINDER)	**Paper Jam around Paper Receiving Sensor 1** Displayed to interrupt the machine operation: • If the Paper receiving sensor 1 detects paper when the Pressure detection sensor detects the Pressure disc. • If the Paper receiving sensor 2 detects paper when the Paper receiving sensor 1 detects the next sheet of paper.	Turn OFF Paper receiving Sensors 1/2 or Press <ALL RESET> key.
NO MASTER ON DRUM PRESS ALL RESET KEY AND MAKE A NEW MASTER	**No Master on Drum** Displayed to interrupt the machine operation: • If the Master loading sensor does not detect master on the drum at the Drum C-1 position when the printing starts.	Press <ALL RESET> key.
ORIGINAL MISFEED OPEN ADF COVER AND RESET ORIGINAL	**Original Misfeed** Displayed to interrupt the machine operation: • If the actuator of the Registration sensor is not opened within **1.35 seconds** after the Original pickup motor was turned on.	ADF SW OFF ⇒ ON
ORIGINAL JAM RESET ORIGINAL /1	**Original Jam at Entrance** Displayed to interrupt the machine operation: • If the Original IN sensor has not detected an original within **630 pulses** after the Read pulse motor was turned on. • In ADF original setting, when the ADF original IN sensor has been blocked from the beginning.	ADF SW OFF⇒ON

Display	Details	How to Cancel
ORIGINAL JAM RESET ORIGINAL /3	**Original Jam at the Exit** Displayed after the master has been loaded onto the Drum: • If the Original OUT sensor has been blocked for **1,890 pulses** after the Read pulse motor was turned on.	ADF SW OFF⇒ ON
ORIGINAL JAM REMOVE ORIGINAL. /2	**Oversize** Displayed after the master has been loaded onto the Drum: • If the light path of the Original IN sensor is blocked for **14,173 pulses** (FB type **= 14,803**) after the Read pulse motor is turned on.	ADF cover setting SW OFF ⇒ ON
MASTER MIS-FEED REMOVE MASTER ROLL THEN RE- INSTALL	**Master Mis-Feed** Displayed after the master has been loaded onto the Drum in the master making or confidential process: • If the Master positioning sensor has not detected master material within **787 pulses** (**536 pulses** in confidential process) after the Loading pulse motor started following the master cutting operation. Displayed to interrupt the machine operation when the Master loading button was pressed: • If the Master positioning sensor has not detected master material within **1260 pulses** after the Loading pulse motor was turned on. • If the Master positioning sensor has not detected master material within **787 pulses** after the Loading pulse motor was turned on following the operation of the Cutter motor and the cut master material is removed.	Master making unit setting SW OFF ⇒ ON
CLAMP ERROR REMOVE MASTER ROLL THEN RE- INSTALL ⇓ TO RETURN OPERATION PRESS START KEY	**Master Loading Error (onto the Drum)** Displayed to interrupt the machine operation: • If the Master load sensor does not detect master at the Drum C-1 position during loading of the master on the Drum.	Master loading unit setting SW OFF⇒ ON ⇓ Press <START> key.
MASTER CUT ERROR REMOVE DRUM (PRINT CYLINDER) AND CHECK MASTER	**Master Cut Malfunction** Displayed to interrupt the machine operation in master-making and confidential process: • If master is detected by the Master positioning sensor at Drum A position after the cutting operation and besides it is not detected by the Master positioning sensor at the next Drum A position detection after the second cutting operation.	Drawer connector OFF (Pull out drum.)
REMOVE CUT MASTER STRIP	**A Cut Piece of Master Remains inside the Machine** Displayed: • If the Master positioning sensor detects master material (the reflected light) just after the master cut operation is completed.	Master positioning sensor OFF

Display	Details	How to Cancel
DISPOSAL ERROR REMOVE DRUM (PRINT CYLINDER) AND DISCARD MASTER ⇓ TO RETURN OPERATION PRESS START KEY	**Master Removal Error** Displayed after the Image scanning and Master making operations are completed or in the confidential operation: • If the Master removal sensor does not detect a removed master while the Drum rotates from C-1 to A position, during master removal operation. • If the light path of the Master removal sensor is still blocked by a removed master when the Vertical transport motor stops. * The above checking operation is performed before master removal only when a master exists on the drum.	Drum set SW OFF ⇒ ON ⇓ Push <START> key.
REMOVE JAMMED MASTER IN DISPOSAL UNIT	**Removed Master Jammed at the entrance of Master disposal box** Displayed: • If the light path of the Master removal sensor is blocked at the start of master-making operation. • If the light path of the Master removal hook sensor is not blocked at the start of master-making operation.	Master removal sensor OFF, Master removal hook sensor ON
EMPTY DISPOSAL BOX	**Empty Disposal Box** Displayed after the machine operation is finished: • If the disposed master is detected 40 times (50 for A4-drum models) by the Master removal sensor after the Disposal box was emptied.	Master disposal box setting SW OFF⇒ ON, Disposal box master sensor OFF
CLOSE SHEET FEEDER COVER AND PRESS ALL RESET KEY	**"SF3000" Bulk Sheet Feeder Error** Displayed to interrupt the machine operation: • If the Bulk sheet feeder malfunctions.	Turn ON bulk sheet feed cover setting SW and, then, push <ALL RESET> key.
PAPER JAM IN SORTER CHECK SORTER	**Sorter Error - Paper jammed in Sorter** Displayed to interrupt the machine operation: • If paper has jammed in the sorter.	
CLOSE SORTER'S COVER	**Sorter Error - Sorter door (or cover) is open** Displayed to prevent the machine operation: • If the door (or cover) of the sorter is open.	Cover SW ON Connection SW ON Door SW ON
PAPER REMAINING IN SORTER REMOVE PAPER	**Sorter Error - Paper remains in Sorter** Displayed to prevent the machine operation: • If the sorted sheets remain in the sort bins.	Remove paper and, then, turn ON cover SW (door SW).
SORTER BIN FULL REMOVE PAPER	**Sorter Error - Sorter bins are full** Displayed to interrupt the machine operation: • If the sort bins are full of sorted sheets.	Remove paper and, then, turn ON cover SW (door SW).
WRONG PAPER SIZE SELECTION CHANGE SELECTION	**Sorter Error - Wrong paper size is selected** Displayed to prevent the machine operation: • If the paper size selection on the sorter does not match with the size of the paper loaded on the Paper feed tray.	Remove paper and, then, turn ON cover SW (door SW). Or, reset paper size.
PAPER SIZE NOT ACCEPTABLE FOR SORTER	**Sorter Error - Unavailable paper size** Displayed to prevent the machine operation: • If the size of the paper loaded on the Paper feed tray is out of the range of paper size which can be used in the sorter.	Change paper size.

3. SETTING CONFIRMATION MESSAGES

Display	Details	How to Cancel
CLOSE FRONT COVER	**Close Front Cover** Displayed to prevent the machine operation: • If the metal plate is not attached to the Front cover set sensor.	Front cover set sensor ON
ADD PAPER	**Add Paper** Displayed to interrupt the machine operation: • If the light path of the Paper detection sensor is open.	Paper detection sensor ON
SET DRUM IN PLACE (INSTALL PRINT CYLINDER)	**Set Drum in Place** Displayed to prevent the machine operation: • If the actuator of the Drum set switch is not depressed.	Drum set SW ON
WRONG-SIZE DRUM (PRINT CYLINDER) INSTALLED	**Drum Size Error** Displayed to prevent the machine operation: • If a wrong size drum is set in the machine.	
WRONG-TYPE DRUM (PRINT CYLINDER) INSTALLED	**Drum Brand Error** Displayed to prevent the machine operation: • If a wrong brand drum is set in the machine.	
INSTALL INK CARTRIDGE	**Set Ink Cartridge in Place** Displayed to prevent the machine operation: • If the actuator of the Ink bottle switch is not depressed.	Ink bottle SW ON
WRONG-TYPE INK CARTRIDGE INSTALLED	**Ink Cartridge Brand Error** Displayed to prevent the machine operation: • If a wrong type of ink cartridge is set in the machine.	
SET (INSTALL) MASTER DISPOSAL BOX	**Set Master Disposal Box in Place** Displayed to prevent the machine operation: • If the actuator of the Disposal box set switch is not depressed.	Disposal box set SW ON
CLOSE SCANNER TABLE	**Close Scanner Table** Displayed to prevent the machine operation: • If the safety switch is not pressed by the Scanner table.	Scanner table set SW ON Interlock SW ON
CLOSE ADF COVER	**Close ADF Unit** Displayed to prevent the machine operation: • If the actuator of the ADF unit set switch is not depressed.	ADF unit set SW ON
CLOSE MASTER LOADING UNIT	**Close Master Loading Unit** Displayed to prevent the machine operation: • If the actuator of the Master loading unit switch is not depressed.	Master loading unit SW
SET LEAD EDGE OF MASTER UNDER GREEN FILM	**Set Leading Edge of Master Under Green Films** Displayed to prevent the machine operation: • If the Master detection sensor does not detect master material (the reflected light).	Master detection sensor ON

Display	Details	How to Cancel
INSERT CARD IN KEY/CARD COUNTER	**Insert Card into Key/Card Counter** Displayed to prevent the machine operation: • If an operator card is not set in the Key/Card counter.	Set a card.

4. CHANGE-OF-CONSUMABLES MESSAGES

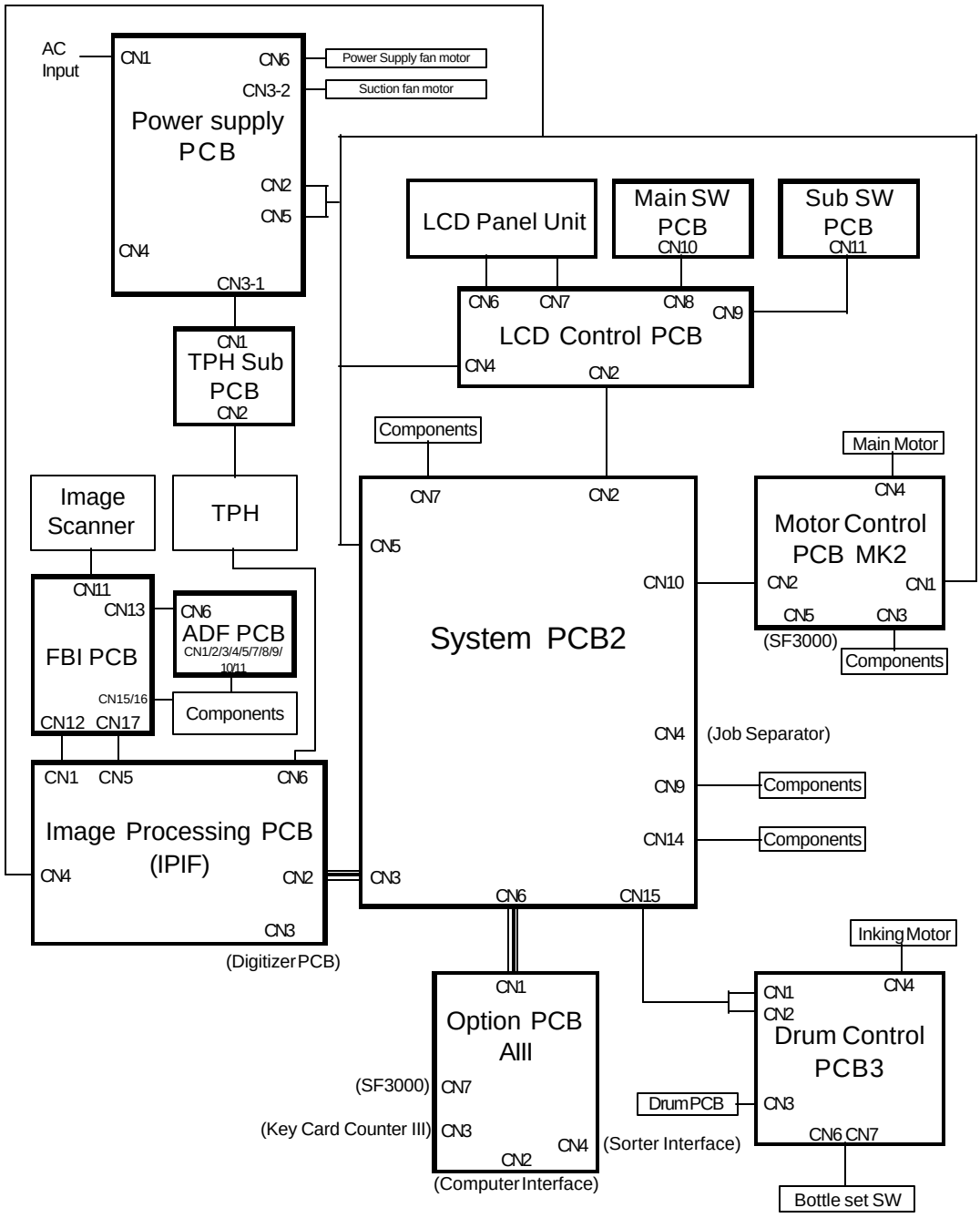
Display	Details	How to Cancel
REPLACE INK CARTRIDGE	**Replace Ink Cartridge** Displayed to interrupt the machine operation: • If the Ink sensor does not detect ink in the Squeegee unit within **30 seconds** after the Inking motor was started.	Ink bottle set SW OFF ⇒ ON
REPLACE MASTER ROLL	**Replace Master Roll** Displayed to interrupt the machine operation: • If the black tape attached at the end of the Master roll has been detected by the Master end sensor during master making or confidential operation.	Master detection sensor OFF ⇒ ON (Master roll need to be replaced.)

APPENDIX (II) DESCRIPTION OF PCB'S

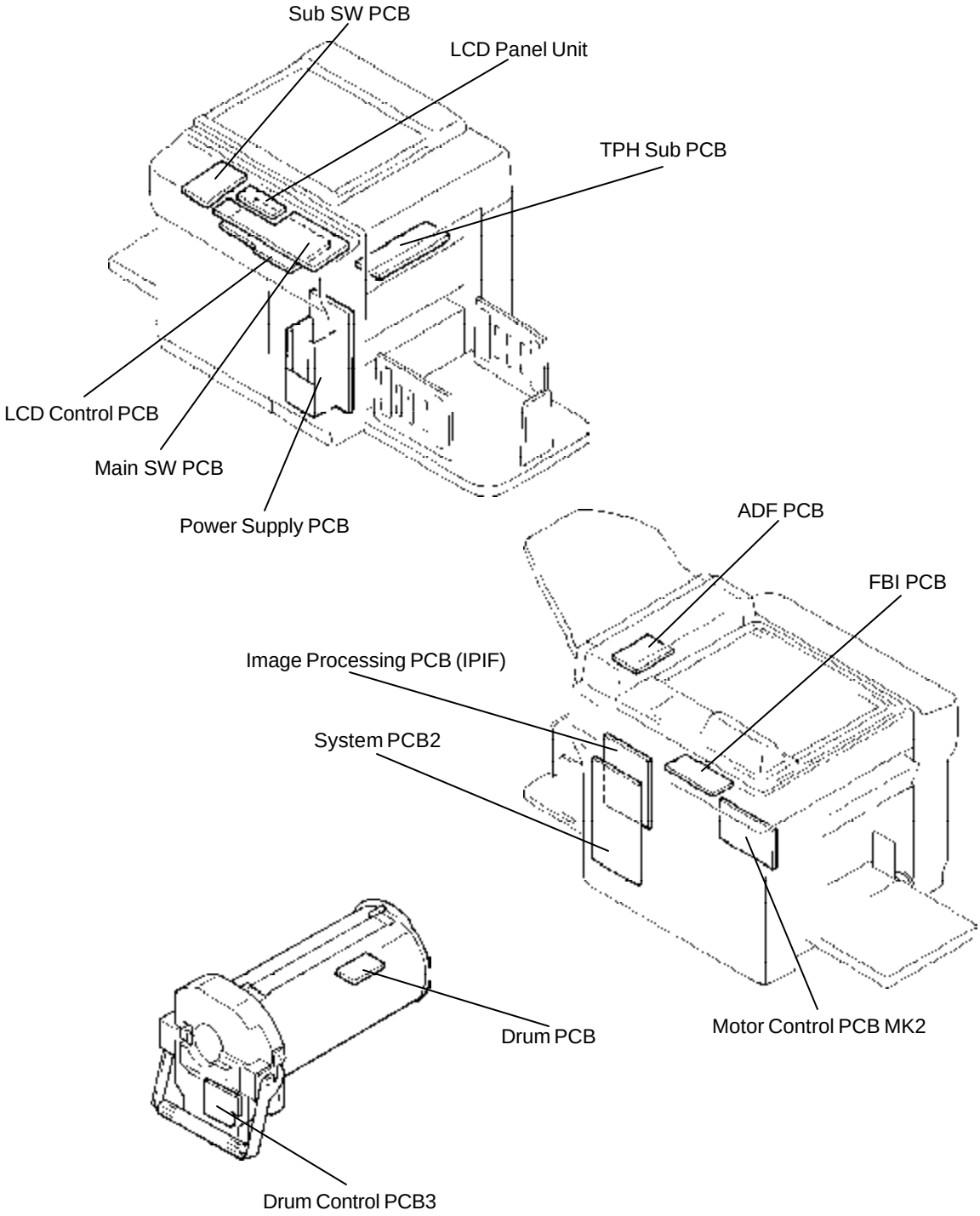
CONTENTS

1. Block Chart ..... APX(II)-1
2. Location of PCBs ..... APX(II)-2
3. SYSTEM PCB2 ..... APX(II)-3
4. Image Processing PCB (IPIF) ..... APX(II)-10
5. Motor Control PCB MK2 ..... APX(II)-13
6. Drum Control PCB3 ..... APX(II)-15
7. ADF PCB ..... APX(II)-17
8. FBI PCB ..... APX(II)-19
9. Option PCB A III ..... APX(II)-22
10. LCD Control PCB ..... APX(II)-24
11. Power Supply PCB 100-120V ..... APX(II)-26
12. Power Supply PCB 200-240V ..... APX(II)-28
13. TPH Sub PCB ..... APX(II)-31

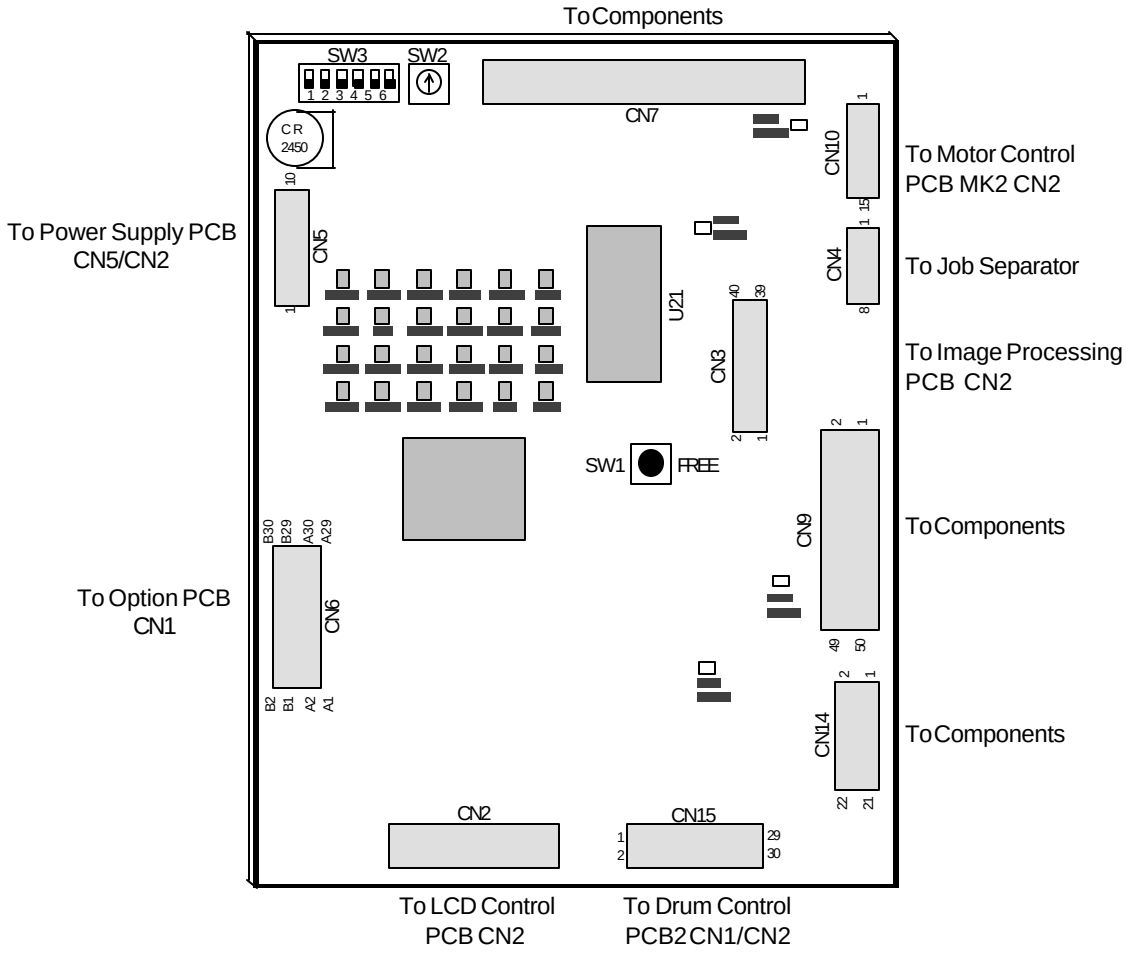
1. Block Chart



2. Location of PCBs



3. SYSTEM PCB2



SW

SW1 : Drum(Main motor) 30 rpm

SW2 : Machine Selection HEX SW

HEX SW set to 3	GR377(Japanese version)
HEX SW set to 7	GR3770(US version/ Ledger)
HEX SW set to A	GR3770(EU,ASIA/ A3)
HEX SW set to D	GR3770(LATIN/ A3)

SW3 : Machine Selection DIP SW
Set all DIP SW(1 through 6) to “OFF” position

LED

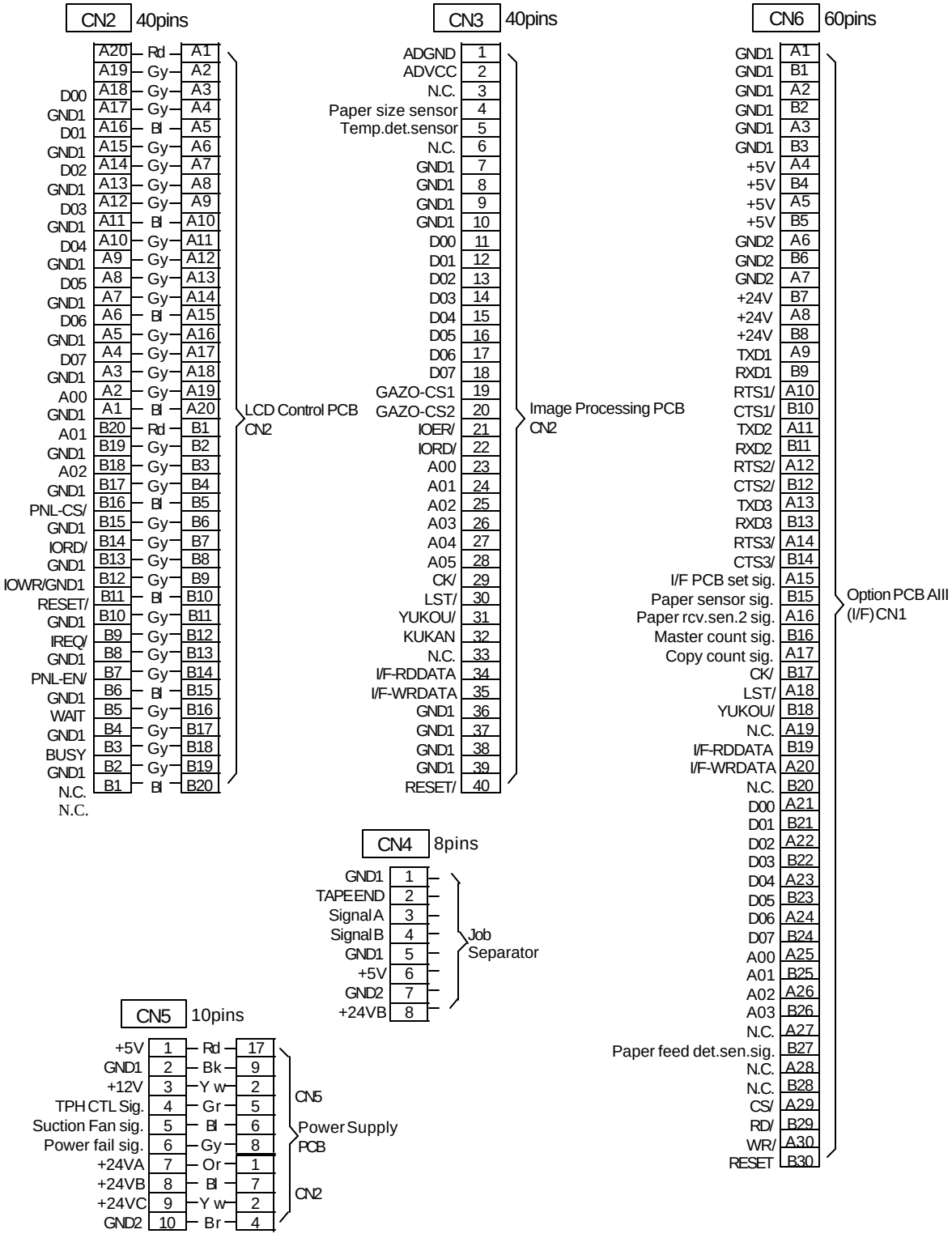
LED	Sensor Name	When LED is ON
DRM0	0 Angular Sensor	Magnetism is detected
DRM1	180 Angular Sensor	Magnetism is detected
PFD2	Paper Feed Clutch Sensor	Light path is blocked
PDTC	Paper Detection Sensor	Reflected light detected
TEN	Vertical Centering Sensor	Light path is blocked
PRSS	Pressure Detection Sensor	Light path is blocked
INK	Ink Sensor	Ink is not detected
FLOW	Overflow Sensor	Ink is not detected
DRMA	Position A Sensor	Light path is blocked
DRMC	Position C Sensor	Light path is blocked
P-UP	Elevator Upper Limit Sensor	Light path is opened (actuator pressed)
HMAS	Disposal Box Master Sensor	Light path is opened (Master not detected)
CSEN	Master Loading Sensor	Reflected light (Master) detected
MEND	Master END Sensor	Reflected light (Master) detected
MDTC	Master Detection Sensor	Reflected light (Master) not detected
MJAM	Master Removal Sensor	Light path is blocked (Master detected)
PTLS	Paper Size Detection Sensor	Reflected light detected (Paper detected)
WAIT	Master Positioning Sensor	Reflected light (Master) not detected
PSEN	Paper Sensor	Light path is blocked (Paper detected)
RCV1	Paper Receiving Sensor 1	Light path is blocked (Paper detected)
RCV2	Paper Receiving Sensor 2	Light path is blocked (Paper detected)
P-IN	Paper Feed Detection Sensor	Light path is blocked (Paper detected)
PRP	Pressure Control Sensor	Light path is opened
TUME	Master Removal Hook Sensor	Light path is opened

TP

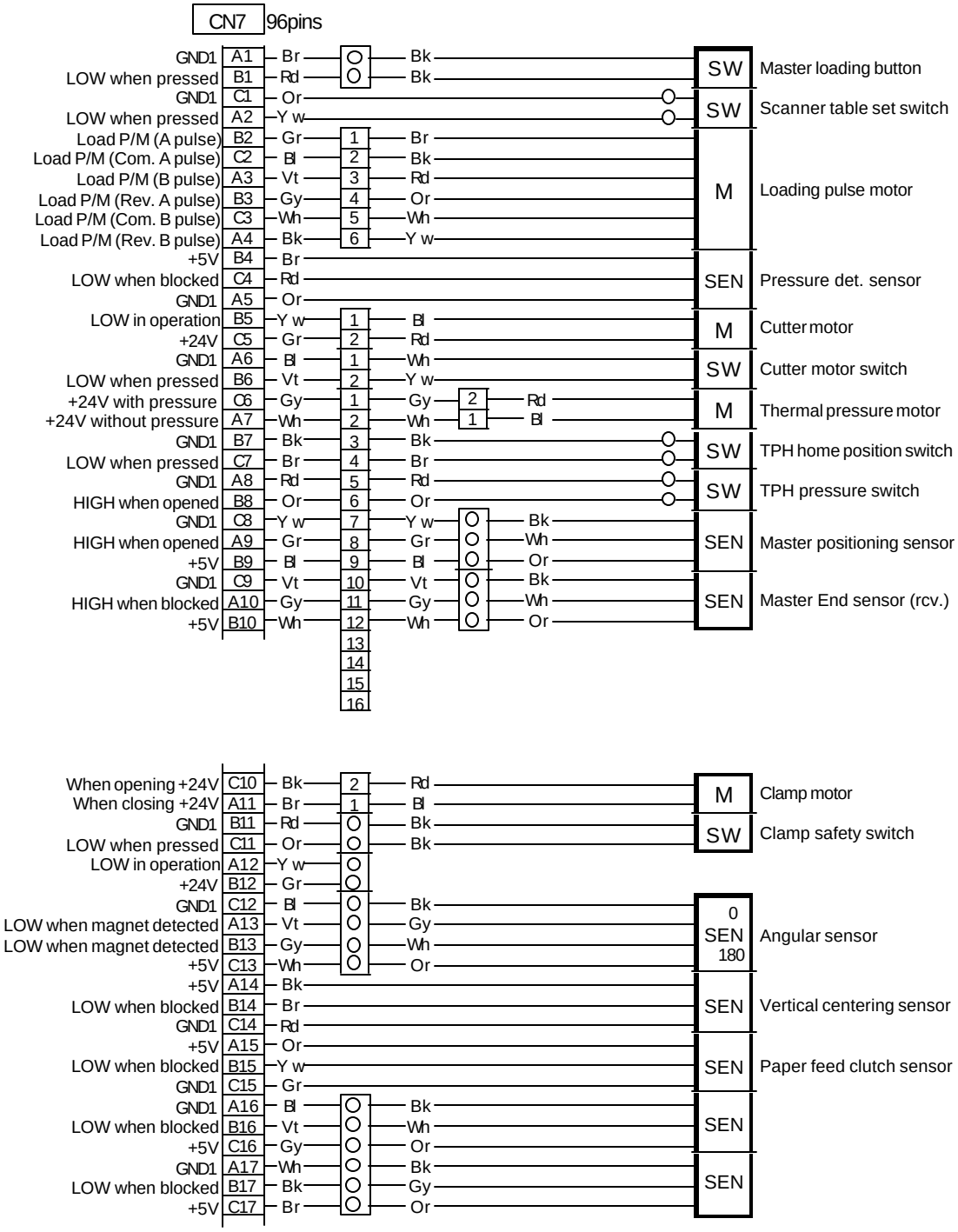
TP1	(GND1)	Ground for 5V lines
TP2	(GND1)	Ground for 12V lines
TP3	(GND2)	Ground for 24VA lines
TP4	(GND2)	Ground for 24VC lines

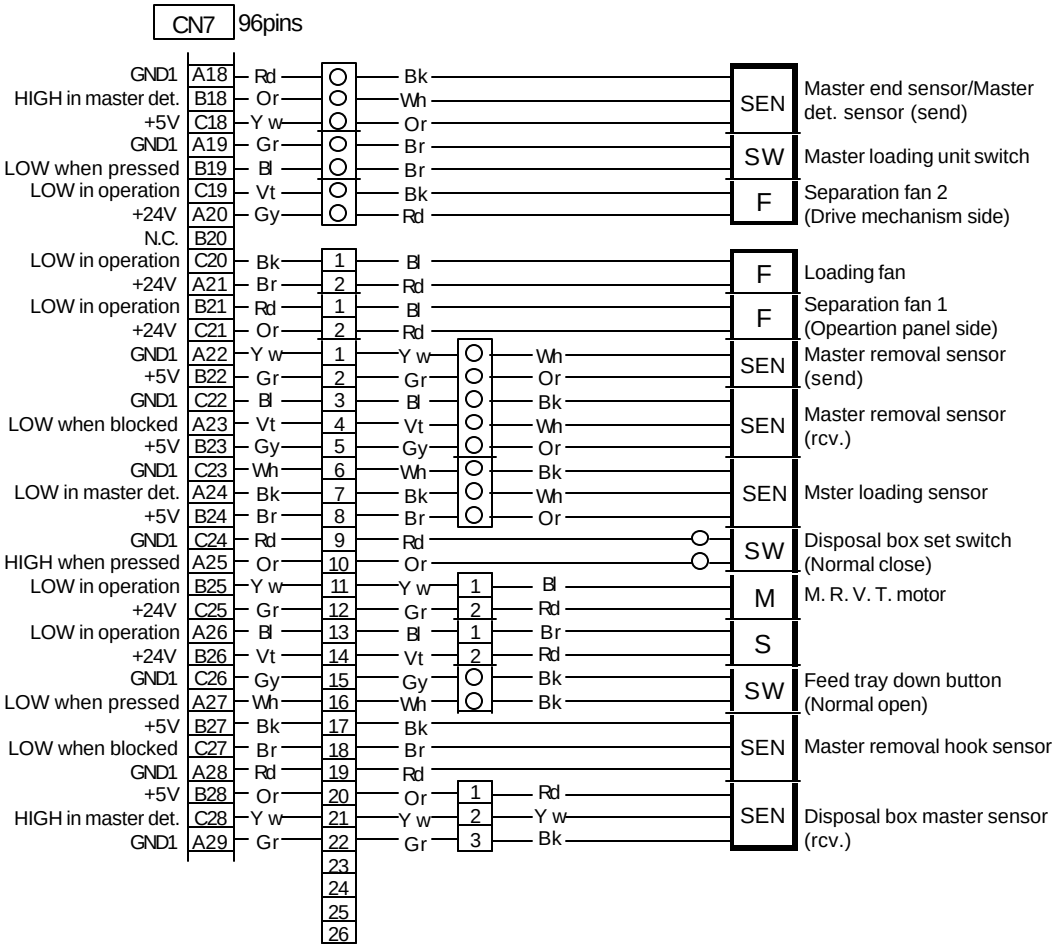
BATTERY

CR2450	1 piece

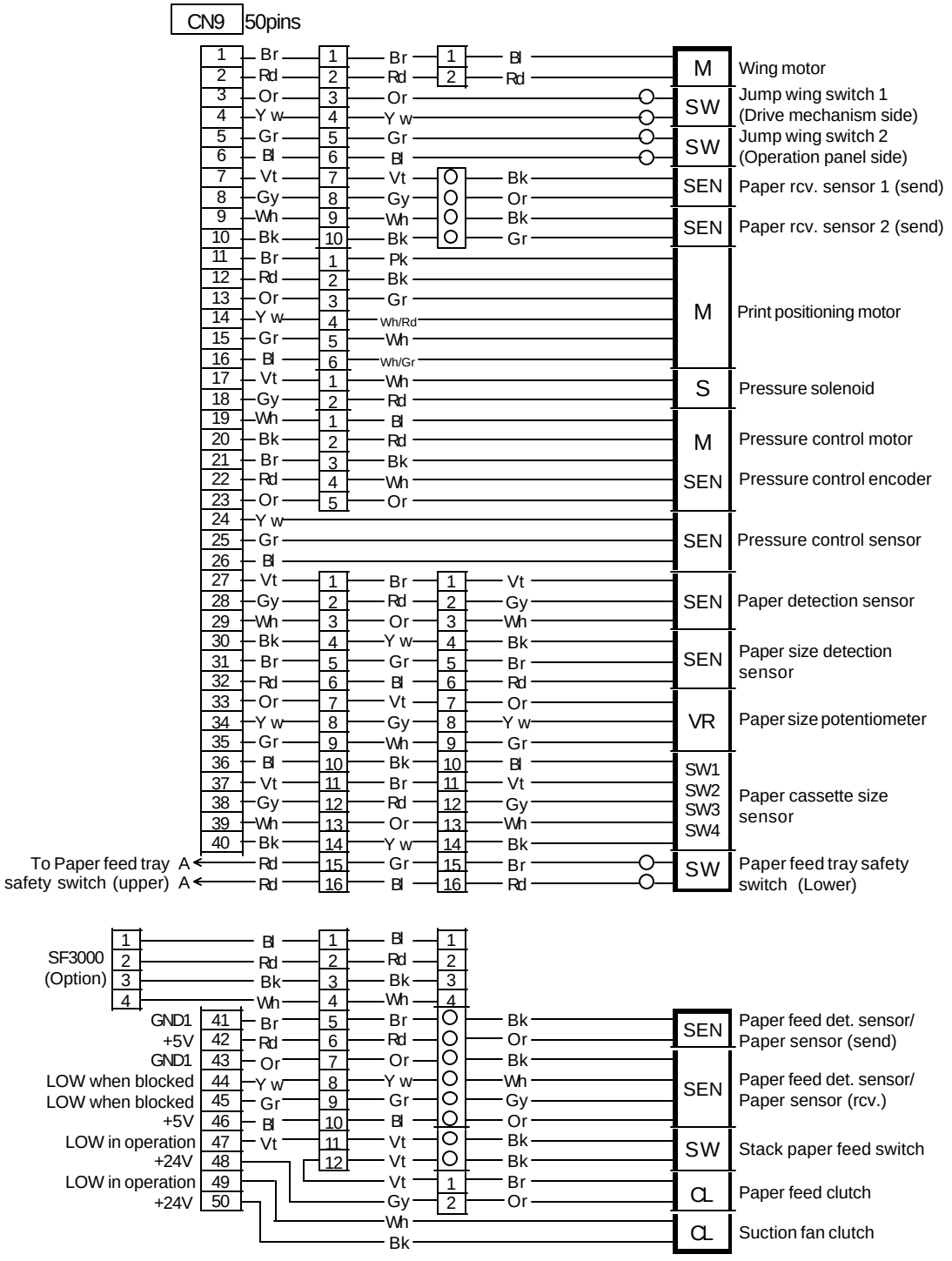

CN2 40pins
A20 Rd A1
A19 Gy A2
D00 A18 Gy A3
GND1 A17 Gy A4
D01 A16 Bl A5
GND1 A15 Gy A6
D02 A14 Gy A7
GND1 A13 Gy A8
D03 A12 Gy A9
GND1 A11 Bl A10
D04 A10 Gy A11
GND1 A9 Gy A12
D05 A8 Gy A13
GND1 A7 Gy A14
D06 A6 Bl A15
GND1 A5 Gy A16
D07 A4 Gy A17
GND1 A3 Gy A18
A00 A2 Gy A19
GND1 A1 Bl A20
A01 B20 Rd B1
GND1 B19 Gy B2
A02 B18 Gy B3
GND1 B17 Gy B4
PNL-CS/ B16 Bl B5
GND1 B15 Gy B6
IORD/ B14 Gy B7
GND1 B13 Gy B8
IOWR/GND1 B12 Gy B9
RESET/ B11 Bl B10
GND1 B10 Gy B11
IREQ/ B9 Gy B12
GND1 B8 Gy B13
PNL-EN/ B7 Gy B14
GND1 B6 Bl B15
WAIT B5 Gy B16
GND1 B4 Gy B17
BUSY B3 Gy B18
GND1 B2 Gy B19
N.C. B1 Bl B20
N.C.
LCD Control PCB
CN2
CN3 40pins
ADGND 1
ADVCC 2
N.C. 3
Paper size sensor 4
Temp.det.sensor 5
N.C. 6
GND1 7
GND1 8
GND1 9
GND1 10
D00 11
D01 12
D02 13
D03 14
D04 15
D05 16
D06 17
D07 18
GAZO-CS1 19
GAZO-CS2 20
IOER/ 21
IORD/ 22
A00 23
A01 24
A02 25
A03 26
A04 27
A05 28
CK/ 29
LST/ 30
YUKOU/ 31
KUKAN 32
N.C. 33
I/F-RDDATA 34
I/F-WRDATA 35
GND1 36
GND1 37
GND1 38
GND1 39
RESET/ 40
Image Processing PCB
CN2
CN6 60pins
GND1 A1
GND1 B1
GND1 A2
GND1 B2
GND1 A3
GND1 B3
+5V A4
+5V B4
+5V A5
+5V B5
GND2 A6
GND2 B6
GND2 A7
+24V B7
+24V A8
+24V B8
TXD1 A9
RXD1 B9
RTS1/ A10
CTS1/ B10
TXD2 A11
RXD2 B11
RTS2/ A12
CTS2/ B12
TXD3 A13
RXD3 B13
RTS3/ A14
CTS3/ B14
I/F PCB set sig. A15
Paper sensor sig. B15
Paper rcv.sen.2 sig. A16
Master count sig. B16
Copy count sig. A17
CK/ B17
LST/ A18
YUKOU/ B18
N.C. A19
I/F-RDDATA B19
I/F-WRDATA A20
N.C. B20
D00 A21
D01 B21
D02 A22
D03 B22
D04 A23
D05 B23
D06 A24
D07 B24
A00 A25
A01 B25
A02 A26
A03 B26
N.C. A27
Paper feed det.sen.sig. B27
N.C. A28
N.C. B28
CS/ A29
RD/ B29
WR/ A30
RESET B30
Option PCB AIII
(I/F) CN1
CN4 8pins
GND1 1
TAPE END 2
Signal A 3
Signal B 4
GND1 5
+5V 6
GND2 7
+24VB 8
Job
Separator
CN5 10pins
+5V 1 Rd 17
GND1 2 Bk 9
+12V 3 Y w 2
TPH CTL Sig. 4 Gr 5
Suction Fan sig. 5 Bl 6
Power fail sig. 6 Gy 8
+24VA 7 Or 1
+24VB 8 Bl 7
+24VC 9 Y w 2
GND2 10 Br 4
CN5
Power Supply
PCB
CN2

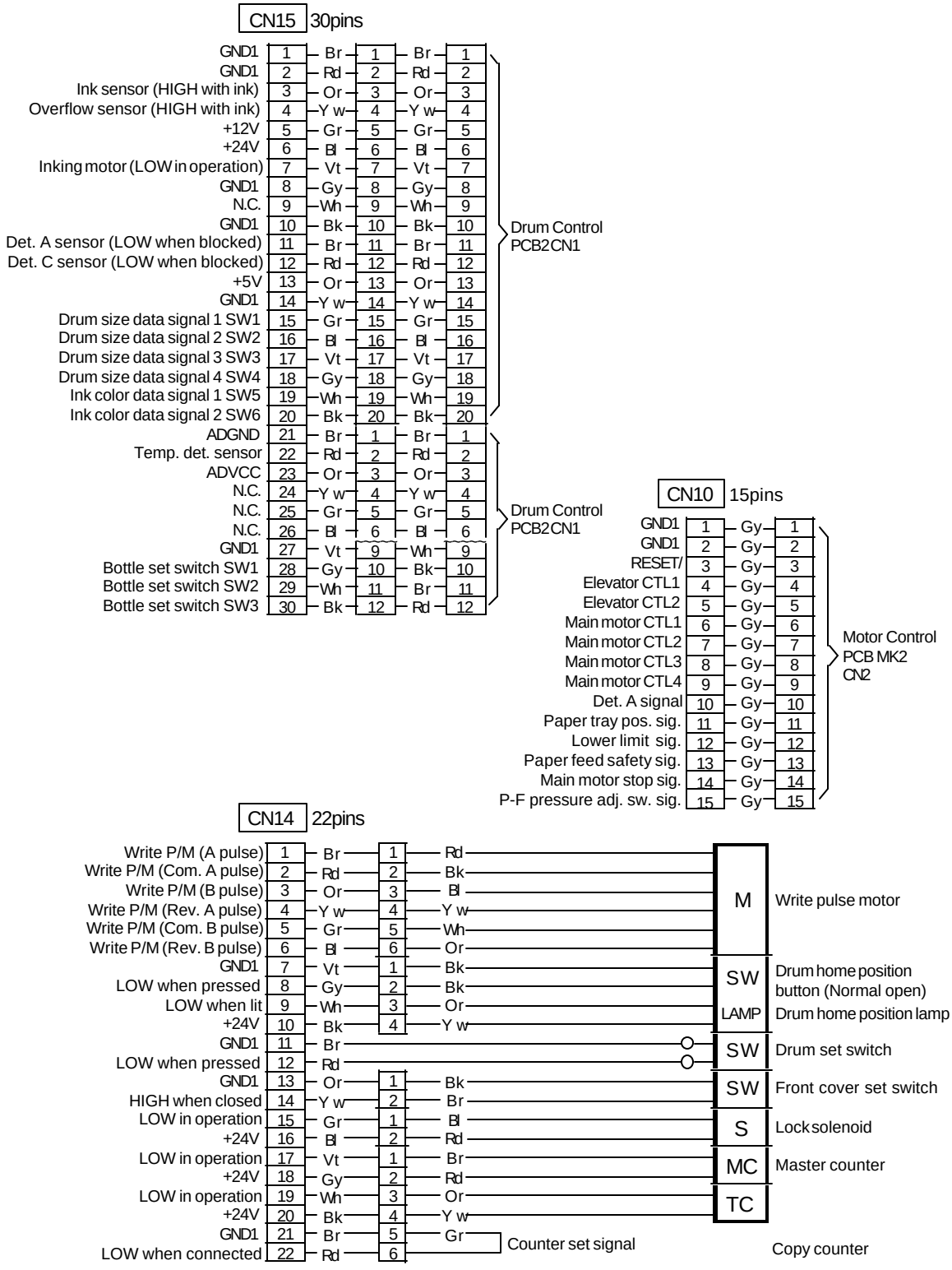
SYSTEM PCB2


CN7 96pins
GND1 A1 Br Bk SW Master loading button
LOW when pressed B1 Rd Bk
GND1 C1 Or SW Scanner table set switch
LOW when pressed A2 Y w
Load P/M (A pulse) B2 Gr 1 Br M Loading pulse motor
Load P/M (Com. A pulse) C2 Bl 2 Bk
Load P/M (B pulse) A3 Vt 3 Rd
Load P/M (Rev. A pulse) B3 Gy 4 Or
Load P/M (Com. B pulse) C3 Wh 5 Wh
Load P/M (Rev. B pulse) A4 Bk 6 Y w
+5V B4 Br SEN Pressure det. sensor
LOW when blocked C4 Rd
GND1 A5 Or
LOW in operation B5 Y w 1 Bl M Cutter motor
+24V C5 Gr 2 Rd
GND1 A6 Bl 1 Wh SW Cutter motor switch
LOW when pressed B6 Vt 2 Y w
+24V with pressure C6 Gy 1 Gy 2 Rd M Thermal pressure motor
+24V without pressure A7 Wh 2 Wh 1 Bl
GND1 B7 Bk 3 Bk SW TPH home position switch
LOW when pressed C7 Br 4 Br
GND1 A8 Rd 5 Rd SW TPH pressure switch
HIGH when opened B8 Or 6 Or
GND1 C8 Y w 7 Y w Bk SEN Master positioning sensor
HIGH when opened A9 Gr 8 Gr Wh
+5V B9 Bl 9 Bl Or
GND1 C9 Vt 10 Vt Bk SEN Master End sensor (rcv.)
HIGH when blocked A10 Gy 11 Gy Wh
+5V B10 Wh 12 Wh Or
13
14
15
16
When opening +24V C10 Bk 2 Rd M Clamp motor
When closing +24V A11 Br 1 Bl
GND1 B11 Rd Bk SW Clamp safety switch
LOW when pressed C11 Or Bk
LOW in operation A12 Y w
+24V B12 Gr
GND1 C12 Bl Bk 0 SEN 180 Angular sensor
LOW when magnet detected A13 Vt Gy
LOW when magnet detected B13 Gy Wh
+5V C13 Wh Or
+5V A14 Bk SEN Vertical centering sensor
LOW when blocked B14 Br
GND1 C14 Rd
+5V A15 Or SEN Paper feed clutch sensor
LOW when blocked B15 Y w
GND1 C15 Gr
GND1 A16 Bl Bk SEN
LOW when blocked B16 Vt Wh
+5V C16 Gy Or
GND1 A17 Wh Bk SEN
LOW when blocked B17 Bk Gy
+5V C17 Br Or

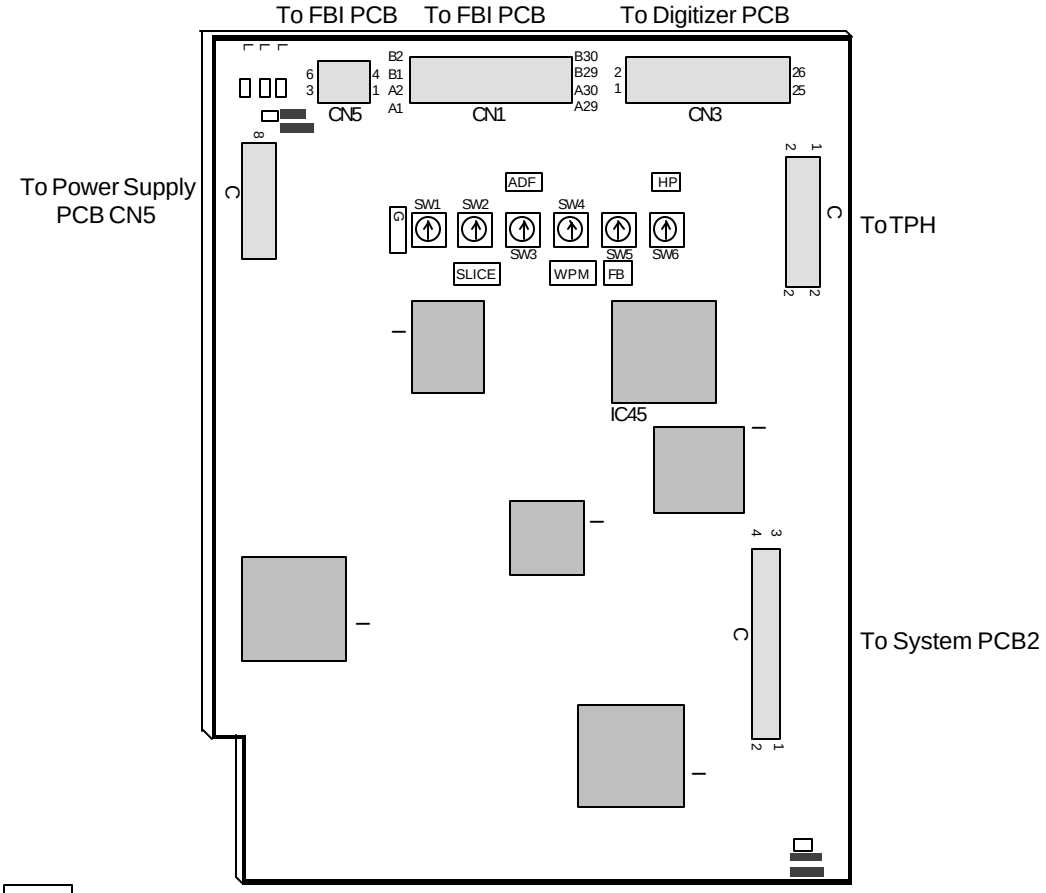

CN7 96pins
GND1 A18 Rd
HIGH in master det. B18 Or
+5V C18 Y w
GND1 A19 Gr
LOW when pressed B19 Bl
LOW in operation C19 Vt
+24V A20 Gy
N.C. B20
LOW in operation C20 Bk
+24V A21 Br
LOW in operation B21 Rd
+24V C21 Or
GND1 A22 Y w
+5V B22 Gr
GND1 C22 Bl
LOW when blocked A23 Vt
+5V B23 Gy
GND1 C23 Wh
LOW in master det. A24 Bk
+5V B24 Br
GND1 C24 Rd
HIGH when pressed A25 Or
LOW in operation B25 Y w
+24V C25 Gr
LOW in operation A26 Bl
+24V B26 Vt
GND1 C26 Gy
LOW when pressed A27 Wh
+5V B27 Bk
LOW when blocked C27 Br
GND1 A28 Rd
+5V B28 Or
HIGH in master det. C28 Y w
GND1 A29 Gr
Bk Wh Or Br Br Bk Rd
SEN
Master end sensor/Master det. sensor (send)
SW
Master loading unit switch
F
Separation fan 2 (Drive mechanism side)
Bl Rd
F
Loading fan
Bl Rd
F
Separation fan 1 (Opeartion panel side)
Y w Gr Bl Vt Gy Wh Bk Br Rd Or Y w Gr Bl Vt Gy Wh Bk Br Rd Or Y w Gr
Wh Or Bk Wh Or Bk Wh Or
SEN
Master removal sensor (send)
SEN
Master removal sensor (rcv.)
SEN
Mster loading sensor
SW
Disposal box set switch (Normal close)
Bl Rd Br Rd
M
M. R. V. T. motor
S
Bk Bk
SW
Feed tray down button (Normal open)
Bk Br Rd
SEN
Master removal hook sensor
Rd Y w Bk
SEN
Disposal box master sensor (rcv.)
+5v B29 Bl
GND1 C29 Vt
+24VA A30 Gy
LOW in operation B30 Wh
+24VA C30 Bk
LOW in operation A31 Br
LOW in operation B31 Rd
+24VC C31 Or
N.C. A32 Y w
N.C. B32 Gr
GND2 C32 Bl
Rd Bk Rd Bk Bk Bk
F
Master removal fan 1
F
Master removal fan 2
SEN
Disposal box master sensor (send)

SYSTEM PCB2


CN9 50pins
M Wing motor
SW Jump wing switch 1 (Drive mechanism side)
SW Jump wing switch 2 (Operation panel side)
SEN Paper rcv. sensor 1 (send)
SEN Paper rcv. sensor 2 (send)
M Print positioning motor
S Pressure solenoid
M Pressure control motor
SEN Pressure control encoder
SEN Pressure control sensor
SEN Paper detection sensor
SEN Paper size detection sensor
VR Paper size potentiometer
SW1 SW2 SW3 SW4 Paper cassette size sensor
To Paper feed tray safety switch (upper)
SW Paper feed tray safety switch (Lower)
SF3000 (Option)
GND1
+5V
GND1
LOW when blocked
LOW when blocked
+5V
LOW in operation
+24V
LOW in operation
+24V
SEN Paper feed det. sensor/ Paper sensor (send)
SEN Paper feed det. sensor/ Paper sensor (rcv.)
SW Stack paper feed switch
CL Paper feed clutch
CL Suction fan clutch


CN15 30pins
GND1 1 Br 1 Br 1
GND1 2 Rd 2 Rd 2
Ink sensor (HIGH with ink) 3 Or 3 Or 3
Overflow sensor (HIGH with ink) 4 Y w 4 Y w 4
+12V 5 Gr 5 Gr 5
+24V 6 Bl 6 Bl 6
Inking motor (LOW in operation) 7 Vt 7 Vt 7
GND1 8 Gy 8 Gy 8
N.C. 9 Wh 9 Wh 9
GND1 10 Bk 10 Bk 10
Det. A sensor (LOW when blocked) 11 Br 11 Br 11
Det. C sensor (LOW when blocked) 12 Rd 12 Rd 12
+5V 13 Or 13 Or 13
GND1 14 Y w 14 Y w 14
Drum size data signal 1 SW1 15 Gr 15 Gr 15
Drum size data signal 2 SW2 16 Bl 16 Bl 16
Drum size data signal 3 SW3 17 Vt 17 Vt 17
Drum size data signal 4 SW4 18 Gy 18 Gy 18
Ink color data signal 1 SW5 19 Wh 19 Wh 19
Ink color data signal 2 SW6 20 Bk 20 Bk 20
Drum Control PCB2 CN1
ADGND 21 Br 1 Br 1
Temp. det. sensor 22 Rd 2 Rd 2
ADVCC 23 Or 3 Or 3
N.C. 24 Y w 4 Y w 4
N.C. 25 Gr 5 Gr 5
N.C. 26 Bl 6 Bl 6
GND1 27 Vt 9 Wh 9
Bottle set switch SW1 28 Gy 10 Bk 10
Bottle set switch SW2 29 Wh 11 Br 11
Bottle set switch SW3 30 Bk 12 Rd 12
Drum Control PCB2 CN1
CN10 15pins
GND1 1 Gy 1
GND1 2 Gy 2
RESET/ 3 Gy 3
Elevator CTL1 4 Gy 4
Elevator CTL2 5 Gy 5
Main motor CTL1 6 Gy 6
Main motor CTL2 7 Gy 7
Main motor CTL3 8 Gy 8
Main motor CTL4 9 Gy 9
Det. A signal 10 Gy 10
Paper tray pos. sig. 11 Gy 11
Lower limit sig. 12 Gy 12
Paper feed safety sig. 13 Gy 13
Main motor stop sig. 14 Gy 14
P-F pressure adj. sw. sig. 15 Gy 15
Motor Control PCB MK2 CN2
CN14 22pins
Write P/M (A pulse) 1 Br 1 Rd
Write P/M (Com. A pulse) 2 Rd 2 Bk
Write P/M (B pulse) 3 Or 3 Bl
Write P/M (Rev. A pulse) 4 Y w 4 Y w
Write P/M (Com. B pulse) 5 Gr 5 Wh
Write P/M (Rev. B pulse) 6 Bl 6 Or
M
Write pulse motor
GND1 7 Vt 1 Bk
LOW when pressed 8 Gy 2 Bk
LOW when lit 9 Wh 3 Or
+24V 10 Bk 4 Y w
SW
Drum home position button (Normal open)
LAMP
Drum home position lamp
GND1 11 Br
LOW when pressed 12 Rd
SW
Drum set switch
GND1 13 Or 1 Bk
HIGH when closed 14 Y w 2 Br
SW
Front cover set switch
LOW in operation 15 Gr 1 Bl
+24V 16 Bl 2 Rd
S
Lock solenoid
LOW in operation 17 Vt 1 Br
+24V 18 Gy 2 Rd
MC
Master counter
LOW in operation 19 Wh 3 Or
+24V 20 Bk 4 Y w
TC
GND1 21 Br 5 Gr
LOW when connected 22 Rd 6
Counter set signal
Copy counter

4. Image Processing PCB (IPIF)



SW

SW1(GAM) : For Gamma compensation adjustment
Light (0) - Dark (F)
SW2(SLICE) : Line mode slice level adjustment
Dark (0) - Standard (8) - Light (F)
SW3(ADF) : ADF Read Pulse Motor speed adjustment(Image elongation/shrinkage)
Shrink (0) - Standard (8) - Elongate (F)
SW4(WPM) : Write Pulse Motor speed adjustment
Shrink (0) - Standard (8) - Elongate (F)
SW5(FB) : FB Read Pulse Motor speed adjustment(Image elongation/shrinkage)
Shrink (0) - Standard (8) - Elongate (F)
SW6(HP) : Paper Size potentiometer compensation adjustment
(0 - F)

LED

LED1(+5V) : +5V
LED2(+12V) : +12V
LED3(+24V) : +24V

TP

TP1 : GND
TP47 : GND

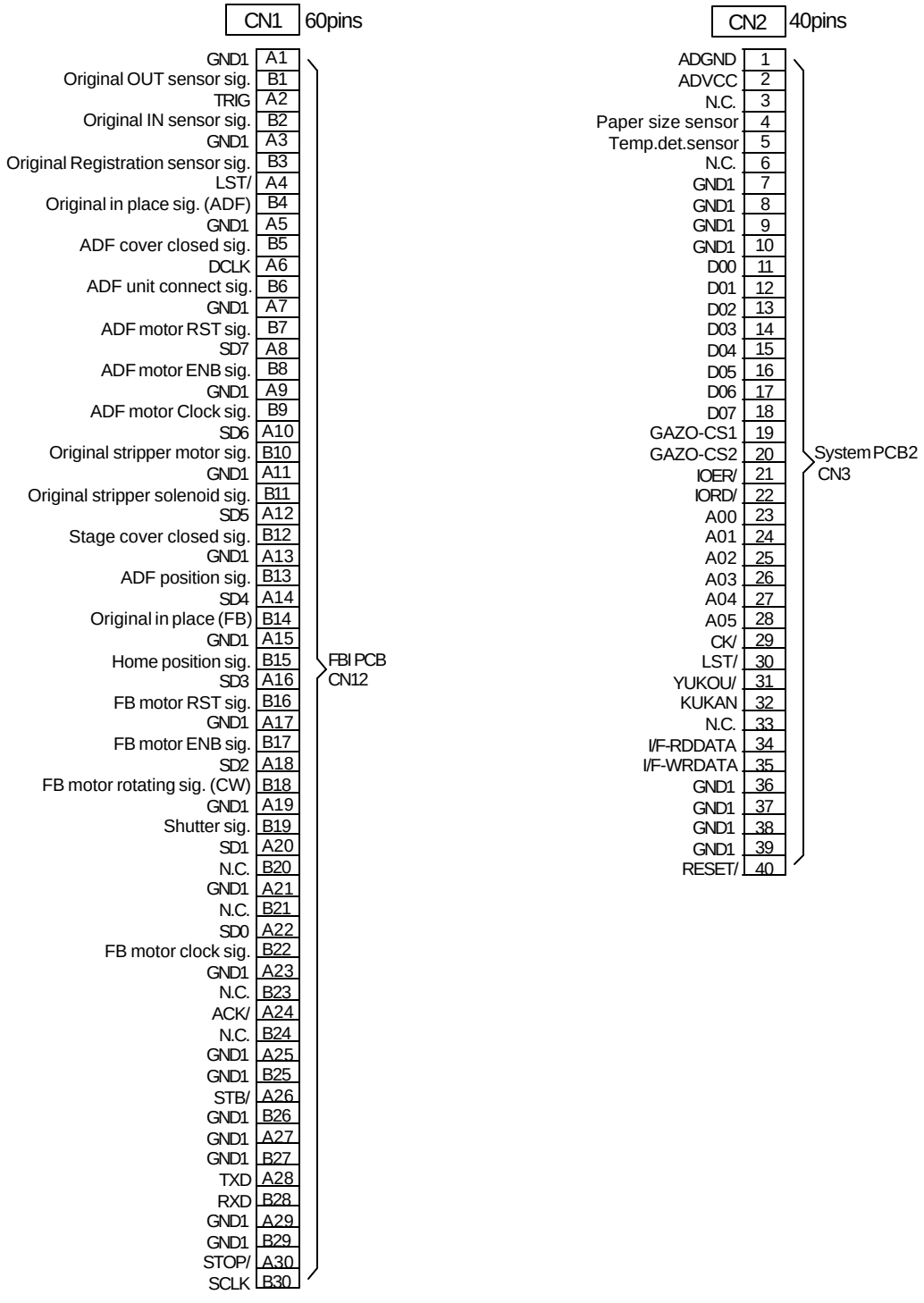
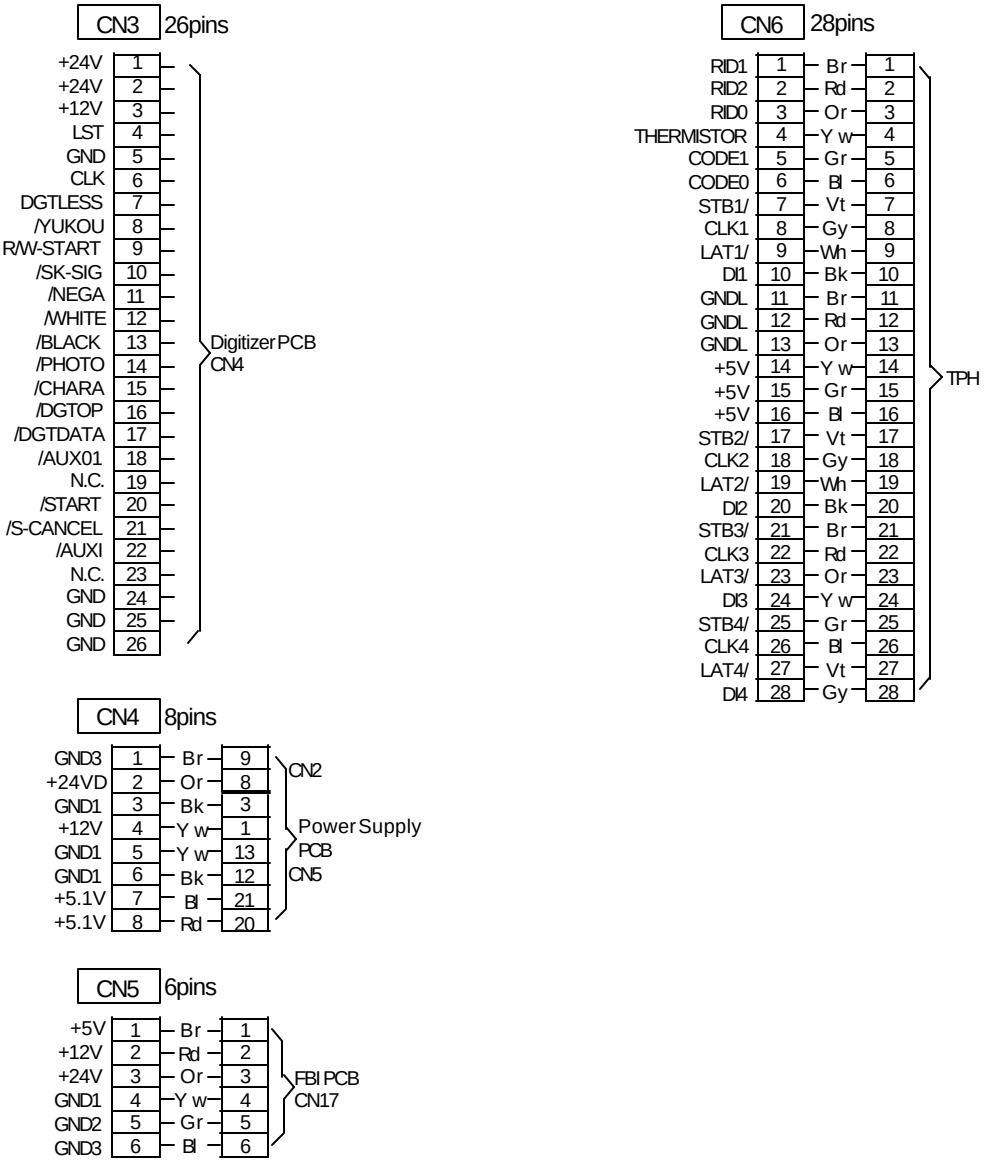
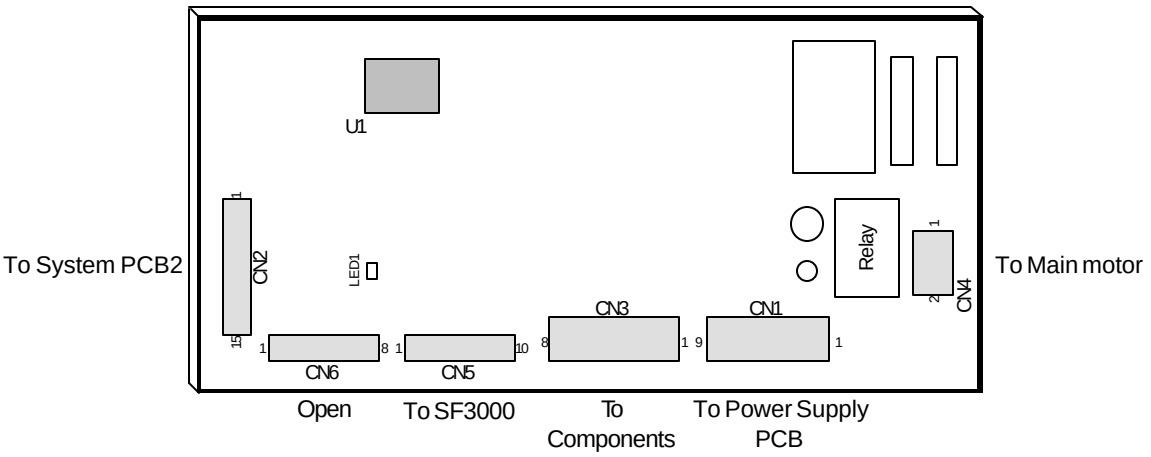

CN1
60pins
GND1 A1
Original OUT sensor sig. B1
TRIG A2
Original IN sensor sig. B2
GND1 A3
Original Registration sensor sig. B3
LST/ A4
Original in place sig. (ADF) B4
GND1 A5
ADF cover closed sig. B5
DCLK A6
ADF unit connect sig. B6
GND1 A7
ADF motor RST sig. B7
SD7 A8
ADF motor ENB sig. B8
GND1 A9
ADF motor Clock sig. B9
SD6 A10
Original stripper motor sig. B10
GND1 A11
Original stripper solenoid sig. B11
SD5 A12
Stage cover closed sig. B12
GND1 A13
ADF position sig. B13
SD4 A14
Original in place (FB) B14
GND1 A15
Home position sig. B15
SD3 A16
FB motor RST sig. B16
GND1 A17
FB motor ENB sig. B17
SD2 A18
FB motor rotating sig. (CW) B18
GND1 A19
Shutter sig. B19
SD1 A20
N.C. B20
GND1 A21
N.C. B21
SD0 A22
FB motor clock sig. B22
GND1 A23
N.C. B23
ACK/ A24
N.C. B24
GND1 A25
GND1 B25
STB/ A26
GND1 B26
GND1 A27
GND1 B27
TXD A28
RXD B28
GND1 A29
GND1 B29
STOP/ A30
SCLK B30
FBI PCB
CN12
CN2
40pins
ADGND 1
ADVCC 2
N.C. 3
Paper size sensor 4
Temp.det.sensor 5
N.C. 6
GND1 7
GND1 8
GND1 9
GND1 10
D00 11
D01 12
D02 13
D03 14
D04 15
D05 16
D06 17
D07 18
GAZO-CS1 19
GAZO-CS2 20
IOER/ 21
IORD/ 22
A00 23
A01 24
A02 25
A03 26
A04 27
A05 28
CK/ 29
LST/ 30
YUKOU/ 31
KUKAN 32
N.C. 33
I/F-RDDATA 34
I/F-WRDATA 35
GND1 36
GND1 37
GND1 38
GND1 39
RESET/ 40
System PCB2
CN3

IMAGE PROCESSING PCB (IPIF)



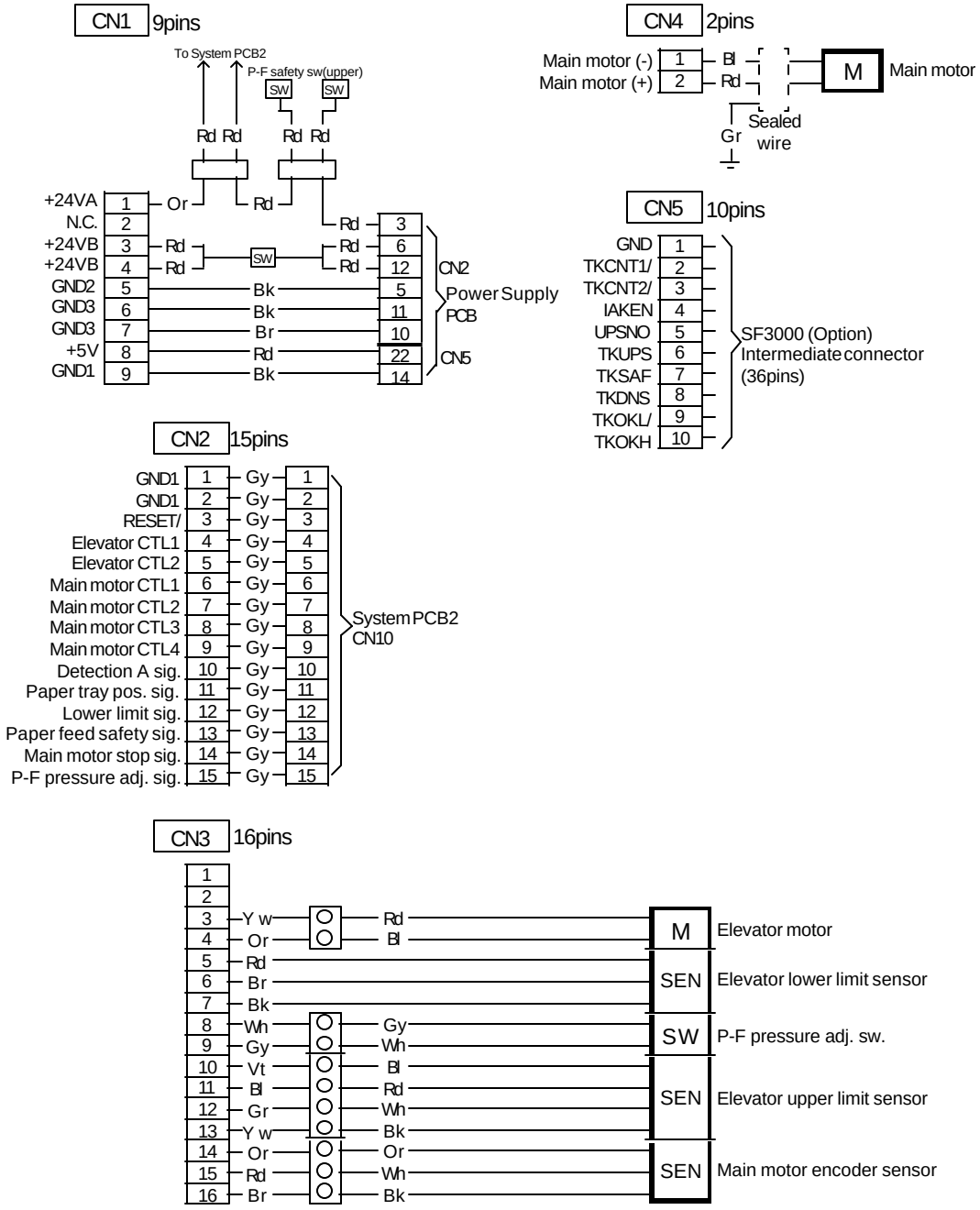
5. Motor Control PCB MK2



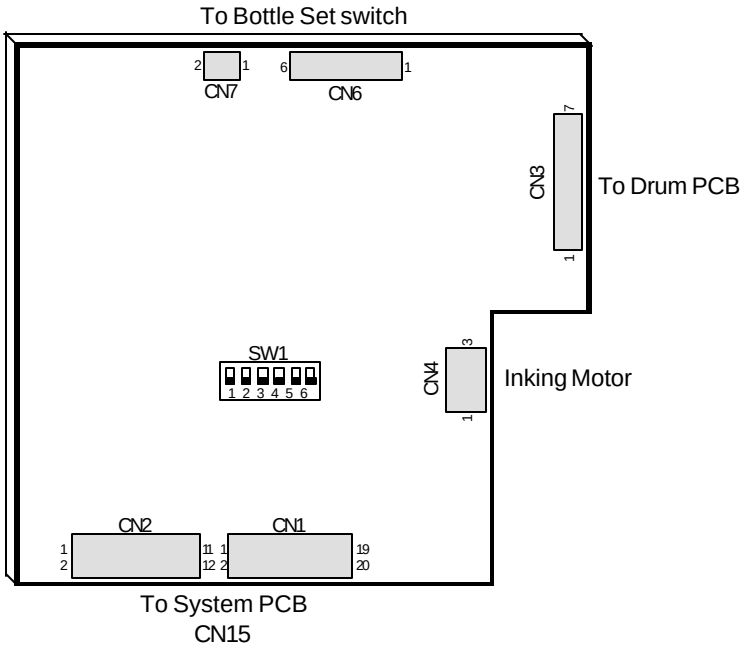
LED

LED1 : The actuator of Elevator upper limit sensor is raised to open the light path.

IMAGE PROCESSING PCB (IPIF)



6. Drum Control PCB3

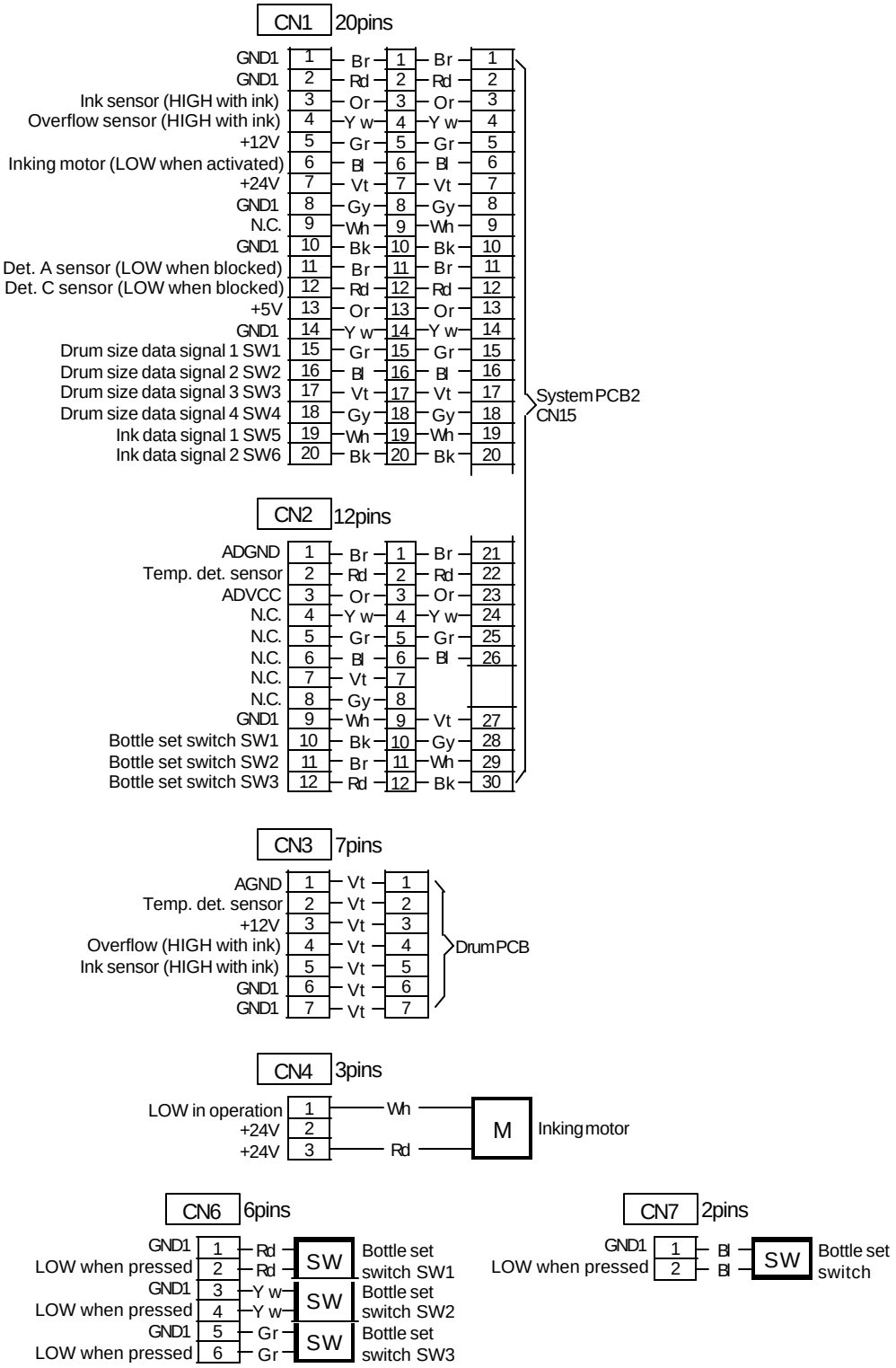


SW

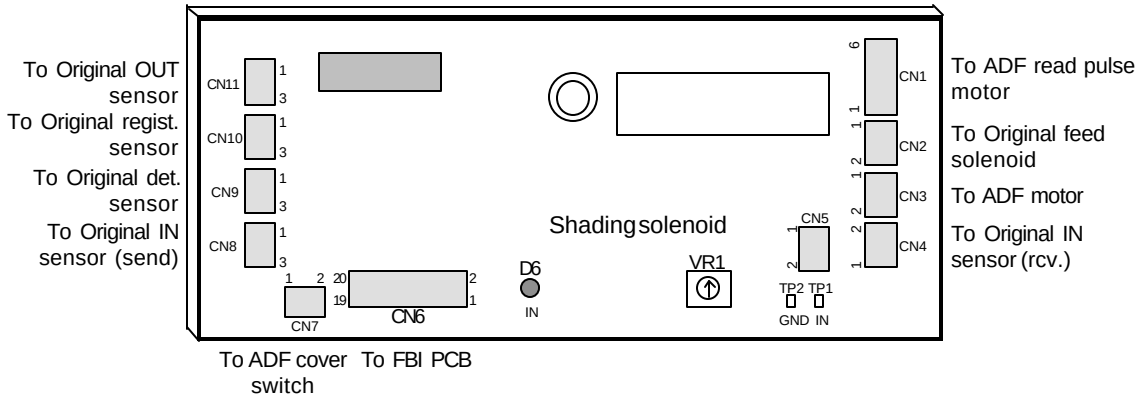
SW1 : Drum Data

DATA	SW	SETTING		
Drum General Data		**STD**		
	1	OFF		
	2	OFF		
Drum Size Data (Ledger/A3)		**Ledger**	**A3**	**A4Wide**
	3	ON	OFF	OFF
	4	OFF	OFF	ON
Ink Data		**HD Black**	**Color**	
	5	OFF	ON	
	6	ON	OFF	

DRUM CONTROL PCB3


CN1 20pins
GND1 1 Br 1 Br 1
GND1 2 Rd 2 Rd 2
Ink sensor (HIGH with ink) 3 Or 3 Or 3
Overflow sensor (HIGH with ink) 4 Y w 4 Y w 4
+12V 5 Gr 5 Gr 5
Inking motor (LOW when activated) 6 Bl 6 Bl 6
+24V 7 Vt 7 Vt 7
GND1 8 Gy 8 Gy 8
N.C. 9 Wh 9 Wh 9
GND1 10 Bk 10 Bk 10
Det. A sensor (LOW when blocked) 11 Br 11 Br 11
Det. C sensor (LOW when blocked) 12 Rd 12 Rd 12
+5V 13 Or 13 Or 13
GND1 14 Y w 14 Y w 14
Drum size data signal 1 SW1 15 Gr 15 Gr 15
Drum size data signal 2 SW2 16 Bl 16 Bl 16
Drum size data signal 3 SW3 17 Vt 17 Vt 17
Drum size data signal 4 SW4 18 Gy 18 Gy 18
Ink data signal 1 SW5 19 Wh 19 Wh 19
Ink data signal 2 SW6 20 Bk 20 Bk 20
System PCB2 CN15
CN2 12pins
ADGND 1 Br 1 Br 21
Temp. det. sensor 2 Rd 2 Rd 22
ADVCC 3 Or 3 Or 23
N.C. 4 Y w 4 Y w 24
N.C. 5 Gr 5 Gr 25
N.C. 6 Bl 6 Bl 26
N.C. 7 Vt 7
N.C. 8 Gy 8
GND1 9 Wh 9 Vt 27
Bottle set switch SW1 10 Bk 10 Gy 28
Bottle set switch SW2 11 Br 11 Wh 29
Bottle set switch SW3 12 Rd 12 Bk 30
CN3 7pins
AGND 1 Vt 1
Temp. det. sensor 2 Vt 2
+12V 3 Vt 3
Overflow (HIGH with ink) 4 Vt 4
Ink sensor (HIGH with ink) 5 Vt 5
GND1 6 Vt 6
GND1 7 Vt 7
Drum PCB
CN4 3pins
LOW in operation 1 Wh
+24V 2
+24V 3 Rd
M
Inking motor
CN6 6pins
GND1 1 Rd
LOW when pressed 2 Rd
SW
Bottle set switch SW1
GND1 3 Y w
LOW when pressed 4 Y w
SW
Bottle set switch SW2
GND1 5 Gr
LOW when pressed 6 Gr
SW
Bottle set switch SW3
CN7 2pins
GND1 1 Bl
LOW when pressed 2 Bl
SW
Bottle set switch

7. ADF PCB



VR

VR1 : For sensitivity adjustment of Original IN sensor (receive)

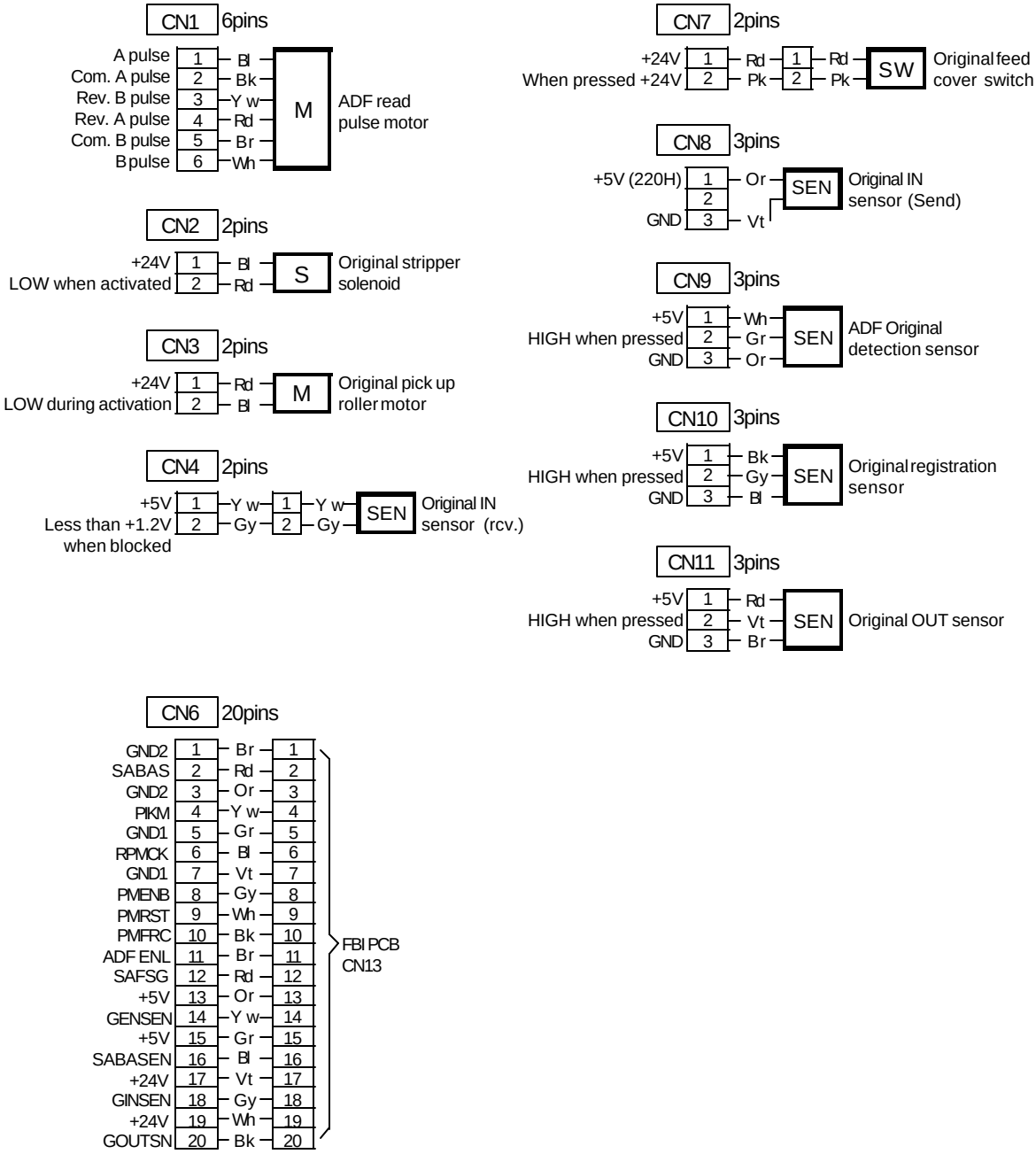
LED - When LED is ON -

D6(IN) : The light path of the Original IN sensor is blocked

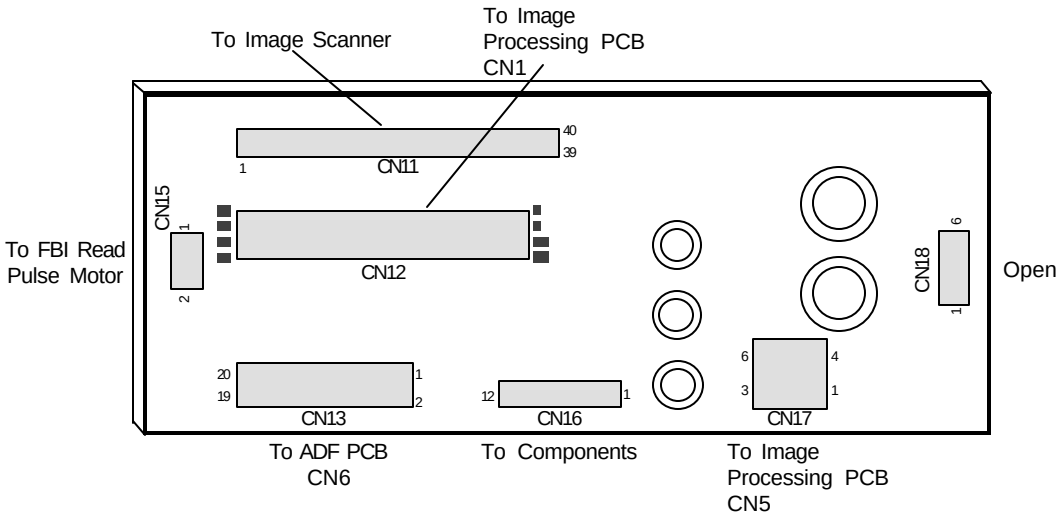
TP

TP1 (IN) : For sensitivity adjustment of Original IN sensor
TP2 (GND) : For sensitivity adjustment of Original IN sensor

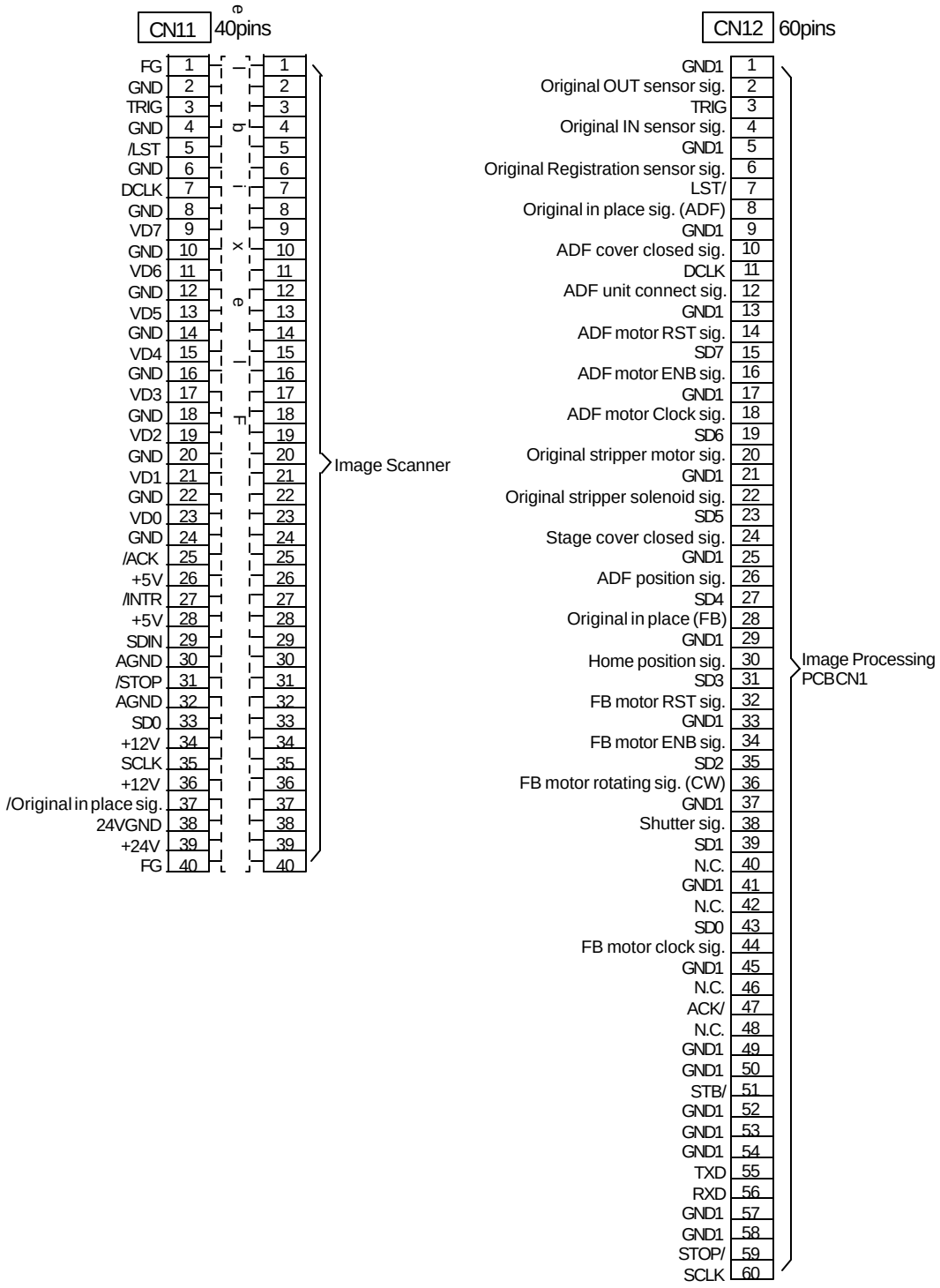
ADF PCB

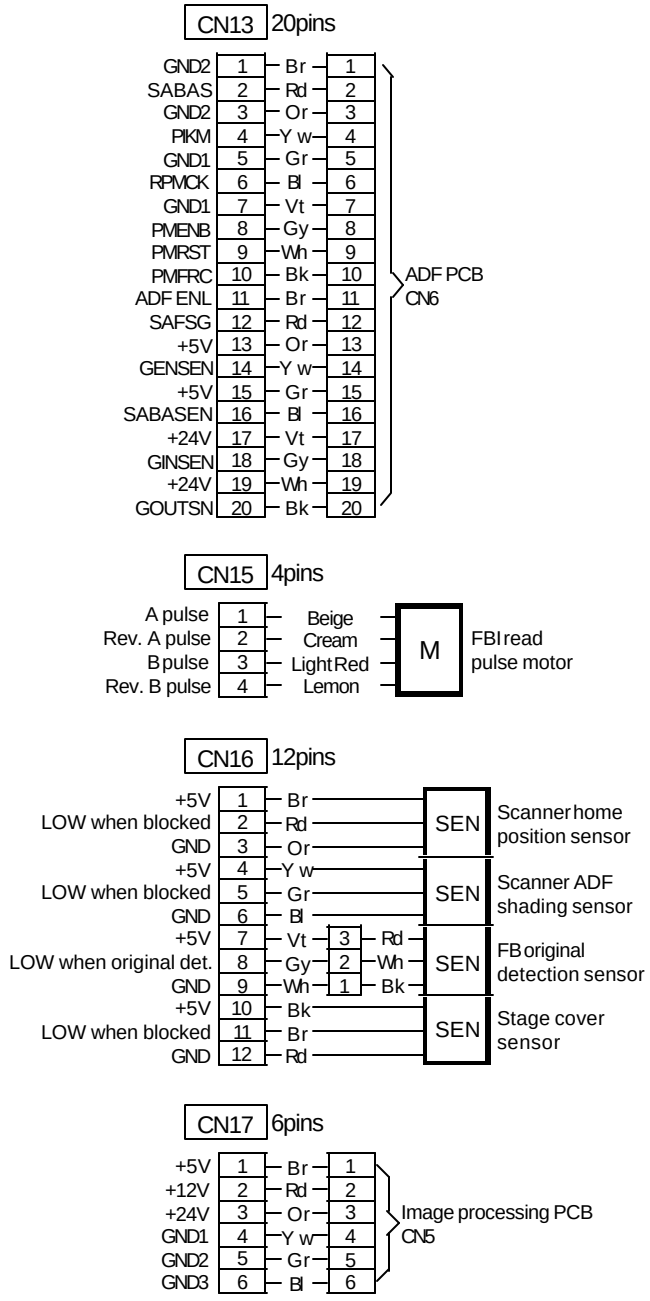

CN1 6pins
A pulse 1 Bl
Com. A pulse 2 Bk
Rev. B pulse 3 Y w
Rev. A pulse 4 Rd
Com. B pulse 5 Br
B pulse 6 Wh
M
ADF read pulse motor
CN2 2pins
+24V 1 Bl
LOW when activated 2 Rd
S
Original stripper solenoid
CN3 2pins
+24V 1 Rd
LOW during activation 2 Bl
M
Original pick up roller motor
CN4 2pins
+5V 1 Y w
Less than +1.2V 2 Gy
when blocked
1 Y w
2 Gy
SEN
Original IN sensor (rcv.)
CN7 2pins
+24V 1 Rd
When pressed +24V 2 Pk
1 Rd
2 Pk
SW
Original feed cover switch
CN8 3pins
+5V (220H) 1 Or
2
GND 3 Vt
SEN
Original IN sensor (Send)
CN9 3pins
+5V 1 Wh
HIGH when pressed 2 Gr
GND 3 Or
SEN
ADF Original detection sensor
CN10 3pins
+5V 1 Bk
HIGH when pressed 2 Gy
GND 3 Bl
SEN
Original registration sensor
CN11 3pins
+5V 1 Rd
HIGH when pressed 2 Vt
GND 3 Br
SEN
Original OUT sensor
CN6 20pins
GND2 1 Br 1
SABAS 2 Rd 2
GND2 3 Or 3
PIKM 4 Y w 4
GND1 5 Gr 5
RPMCK 6 Bl 6
GND1 7 Vt 7
PMENB 8 Gy 8
PMRST 9 Wh 9
PMFRC 10 Bk 10
ADF ENL 11 Br 11
SAFSG 12 Rd 12
+5V 13 Or 13
GENSEN 14 Y w 14
+5V 15 Gr 15
SABASEN 16 Bl 16
+24V 17 Vt 17
GINSEN 18 Gy 18
+24V 19 Wh 19
GOUTSN 20 Bk 20
FBI PCB CN13

8. FBI PCB

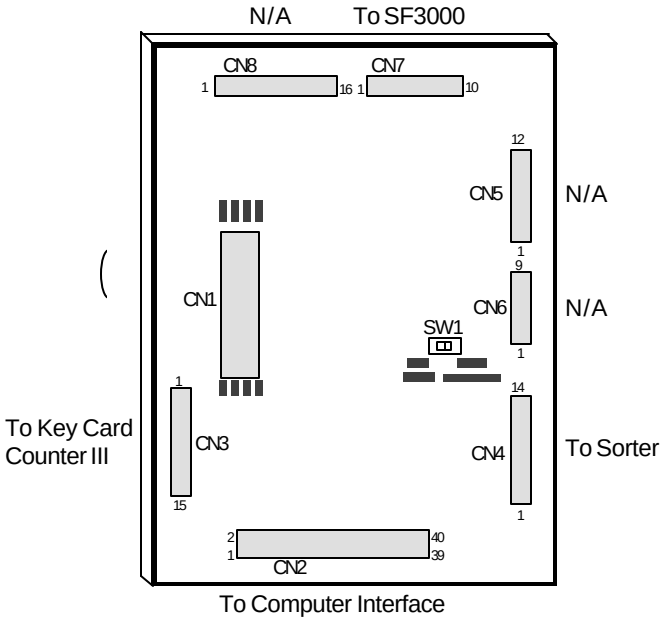

To Image Scanner
To Image Processing PCB CN1
40
39
1
CN11
CN15
1
2
To FBI Read Pulse Motor
CN12
CN18
6
1
Open
20
19
1
2
CN13
12
1
CN16
6
4
3
1
CN17
To ADF PCB CN6
To Components
To Image Processing PCB CN5

FBI PCB


CN11
40pins
FG 1 1
GND 2 2
TRIG 3 3
GND 4 4
/LST 5 5
GND 6 6
DCLK 7 7
GND 8 8
VD7 9 9
GND 10 10
VD6 11 11
GND 12 12
VD5 13 13
GND 14 14
VD4 15 15
GND 16 16
VD3 17 17
GND 18 18
VD2 19 19
GND 20 20
VD1 21 21
GND 22 22
VD0 23 23
GND 24 24
/ACK 25 25
+5V 26 26
/INTR 27 27
+5V 28 28
SDIN 29 29
AGND 30 30
/STOP 31 31
AGND 32 32
SD0 33 33
+12V 34 34
SCLK 35 35
+12V 36 36
/Original in place sig. 37 37
24VGND 38 38
+24V 39 39
FG 40 40
Image Scanner
CN12
60pins
GND1 1
Original OUT sensor sig. 2
TRIG 3
Original IN sensor sig. 4
GND1 5
Original Registration sensor sig. 6
LST/ 7
Original in place sig. (ADF) 8
GND1 9
ADF cover closed sig. 10
DCLK 11
ADF unit connect sig. 12
GND1 13
ADF motor RST sig. 14
SD7 15
ADF motor ENB sig. 16
GND1 17
ADF motor Clock sig. 18
SD6 19
Original stripper motor sig. 20
GND1 21
Original stripper solenoid sig. 22
SD5 23
Stage cover closed sig. 24
GND1 25
ADF position sig. 26
SD4 27
Original in place (FB) 28
GND1 29
Home position sig. 30
SD3 31
FB motor RST sig. 32
GND1 33
FB motor ENB sig. 34
SD2 35
FB motor rotating sig. (CW) 36
GND1 37
Shutter sig. 38
SD1 39
N.C. 40
GND1 41
N.C. 42
SD0 43
FB motor clock sig. 44
GND1 45
N.C. 46
ACK/ 47
N.C. 48
GND1 49
GND1 50
STB/ 51
GND1 52
GND1 53
GND1 54
TXD 55
RXD 56
GND1 57
GND1 58
STOP/ 59
SCLK 60
Image Processing PCB CN1


CN13 20pins
GND2 1 Br 1
SABAS 2 Rd 2
GND2 3 Or 3
PIKM 4 Y w 4
GND1 5 Gr 5
RPMCK 6 Bl 6
GND1 7 Vt 7
PMENB 8 Gy 8
PMRST 9 Wh 9
PMFRC 10 Bk 10
ADF ENL 11 Br 11
SAFSG 12 Rd 12
+5V 13 Or 13
GENSEN 14 Y w 14
+5V 15 Gr 15
SABASEN 16 Bl 16
+24V 17 Vt 17
GINSEN 18 Gy 18
+24V 19 Wh 19
GOUTSN 20 Bk 20
ADF PCB
CN6
CN15 4pins
A pulse 1 Beige
Rev. A pulse 2 Cream
B pulse 3 Light Red
Rev. B pulse 4 Lemon
M
FBI read
pulse motor
CN16 12pins
+5V 1 Br
LOW when blocked 2 Rd
GND 3 Or
+5V 4 Y w
LOW when blocked 5 Gr
GND 6 Bl
+5V 7 Vt 3 Rd
LOW when original det. 8 Gy 2 Wh
GND 9 Wh 1 Bk
+5V 10 Bk
LOW when blocked 11 Br
GND 12 Rd
SEN
Scanner home
position sensor
SEN
Scanner ADF
shading sensor
SEN
FB original
detection sensor
SEN
Stage cover
sensor
CN17 6pins
+5V 1 Br 1
+12V 2 Rd 2
+24V 3 Or 3
GND1 4 Y w 4
GND2 5 Gr 5
GND3 6 Bl 6
Image processing PCB
CN5

9. Option PCB AIII

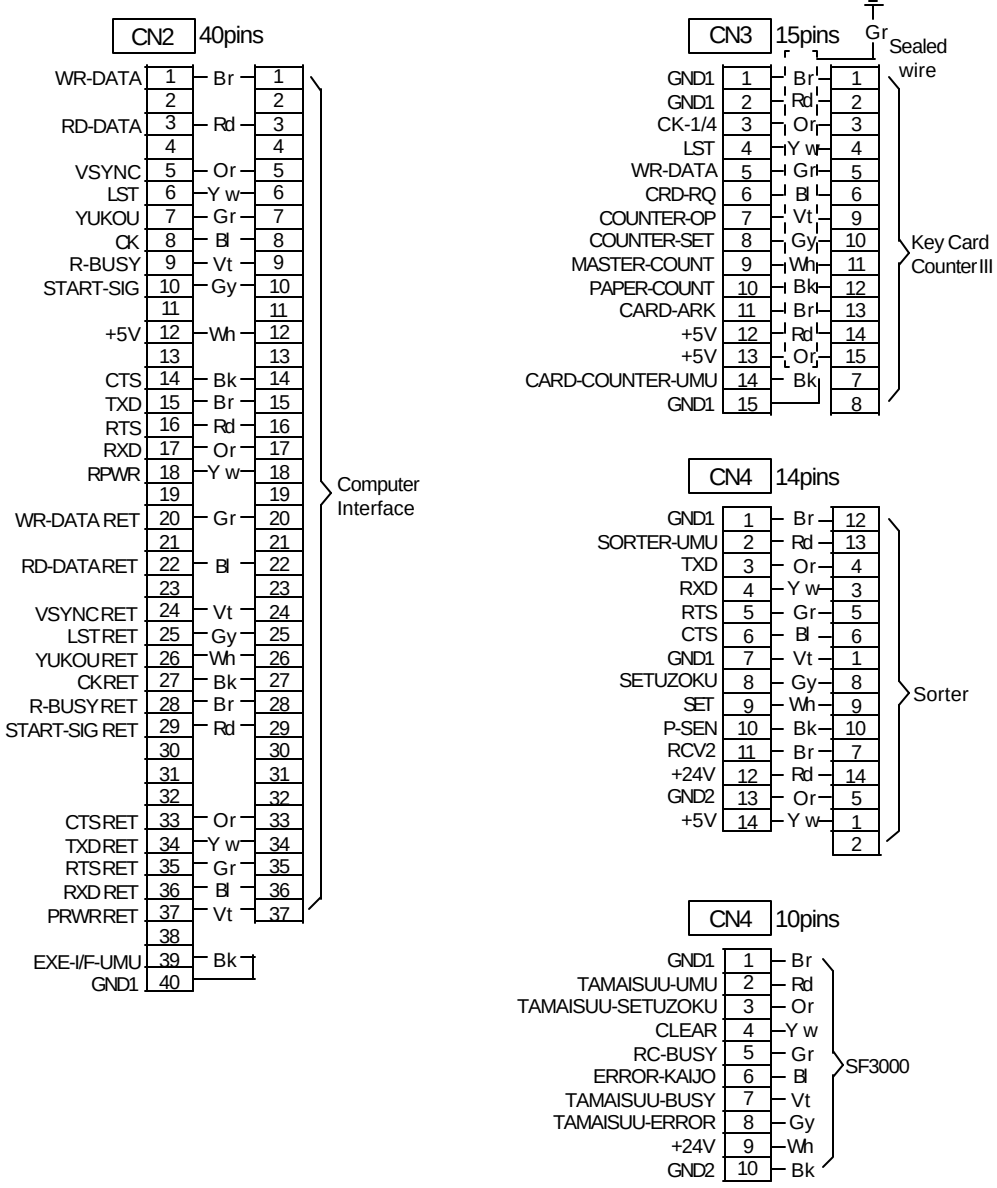


SW

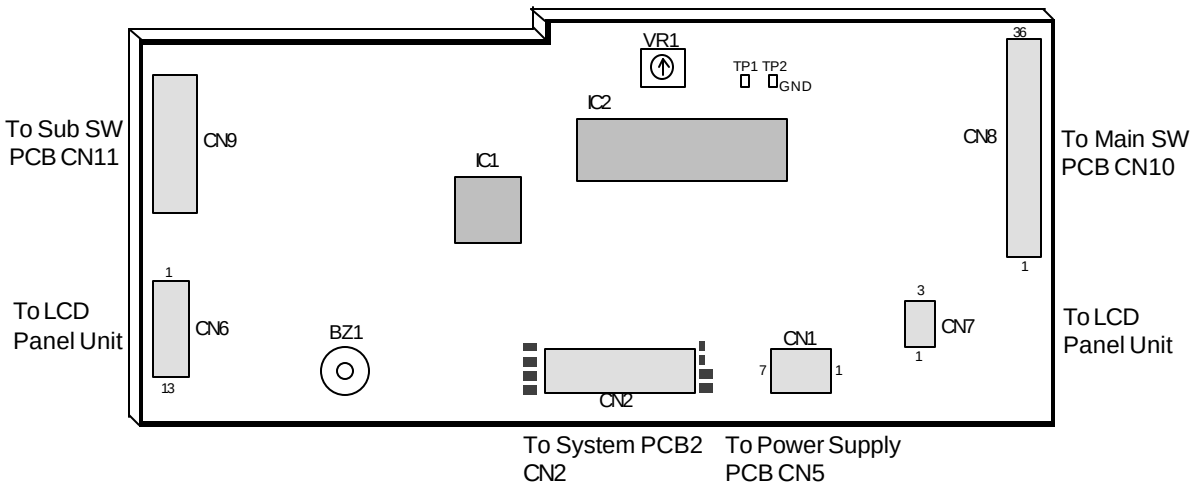
SW1	MODELS
ON	GR3770
OFF	GR3750
	GR2750
	GR2710
	GR1750
	GR1700

CN1 60pins

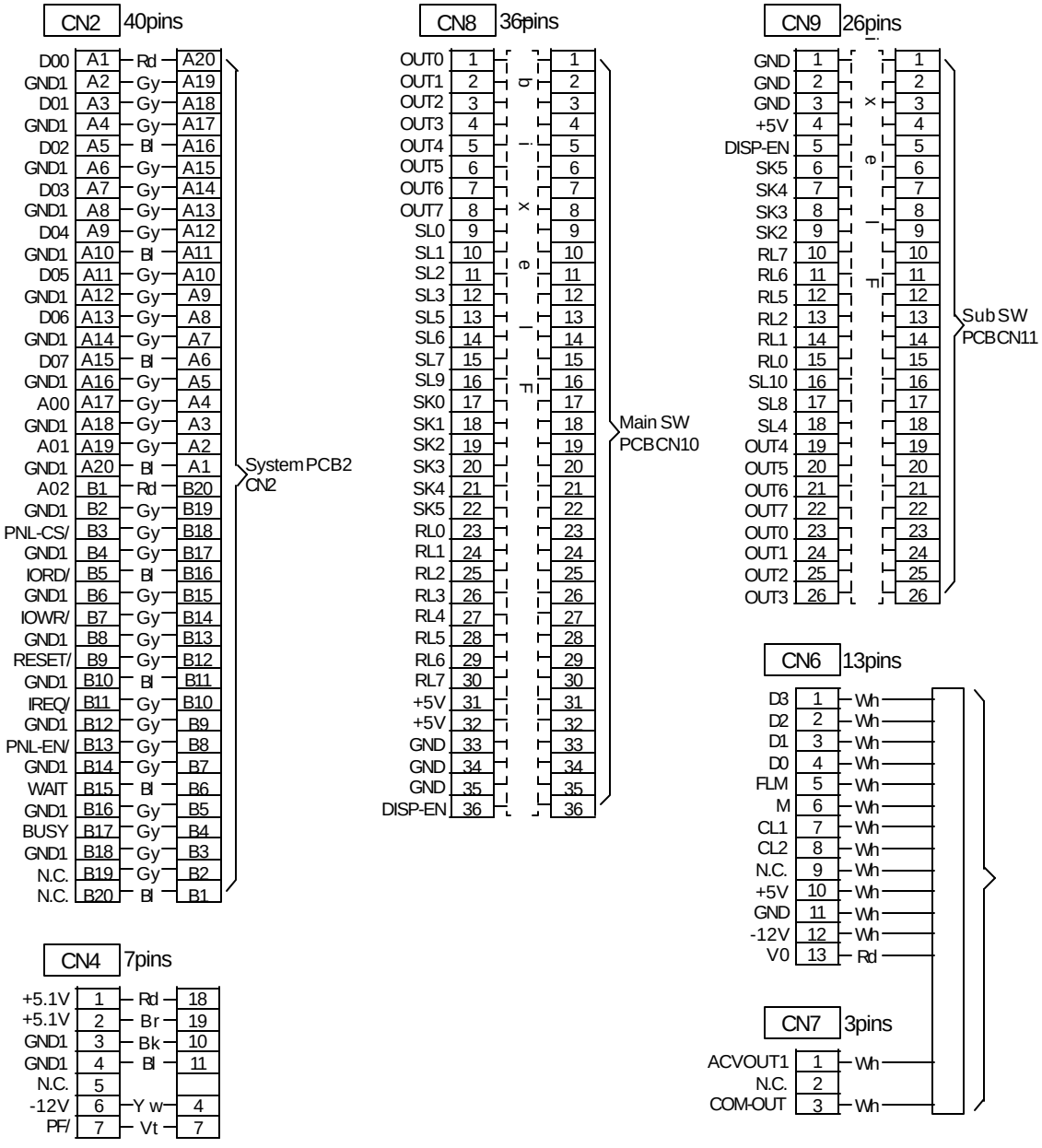
GND1	A1	System PCB2 CN6
GND1	B1	
GND1	A2	
GND1	B2	
GND1	A3	
GND1	B3	
+5V	A4	
+5V	B4	
+5V	A5	
+5V	B5	
GND2	A6	
GND2	B6	
GND2	A7	
+24V	B7	
+24V	A8	
+24V	B8	
TXD1	A9	
RXD1	B9	
RTS1/	A10	
CTS1/	B10	
TXD2	A11	
RXD2	B11	
RTS2/	A12	
CTS2/	B12	
TXD3	A13	
RXD3	B13	
RTS3/	A14	
CTS3/	B14	
I/F PCB set sig.	A15	
Paper sensor sig.	B15	
Paper rcv.sen.2 sig.	A16	
Master count sig.	B16	
Copy count sig.	A17	
CK/	B17	
LST/	A18	
YUKOU/	B18	
N.C.	A19	
I/F-RDDATA	B19	
I/F-WRDATA	A20	
N.C.	B20	
D00	A21	
D01	B21	
D02	A22	
D03	B22	
D04	A23	
D05	B23	
D06	A24	
D07	B24	
A00	A25	
A01	B25	
A02	A26	
A03	B26	
N.C.	A27	
Paper feed det.sen.sig.	B27	
N.C.	A28	
N.C.	B28	
CS/	A29	
RD/	B29	
WR/	A30	
RESET	B30	


CN2 40pins
WR-DATA 1 Br 1
2 2
RD-DATA 3 Rd 3
4 4
VSYNC 5 Or 5
LST 6 Y w 6
YUKOU 7 Gr 7
CK 8 Bl 8
R-BUSY 9 Vt 9
START-SIG 10 Gy 10
11 11
+5V 12 Wh 12
13 13
CTS 14 Bk 14
TXD 15 Br 15
RTS 16 Rd 16
RXD 17 Or 17
RPWR 18 Y w 18
19 19
WR-DATA RET 20 Gr 20
21 21
RD-DATA RET 22 Bl 22
23 23
VSYNC RET 24 Vt 24
LST RET 25 Gy 25
YUKOU RET 26 Wh 26
CK RET 27 Bk 27
R-BUSY RET 28 Br 28
START-SIG RET 29 Rd 29
30 30
31 31
32 32
CTS RET 33 Or 33
TXD RET 34 Y w 34
RTS RET 35 Gr 35
RXD RET 36 Bl 36
PRWR RET 37 Vt 37
38
EXE-I/F-UMU 39 Bk
GND1 40
Computer Interface
CN3 15pins
Gr
Sealed wire
GND1 1 Br 1
GND1 2 Rd 2
CK-1/4 3 Or 3
LST 4 Y w 4
WR-DATA 5 Gr 5
CRD-RQ 6 Bl 6
COUNTER-OP 7 Vt 9
COUNTER-SET 8 Gy 10
MASTER-COUNT 9 Wh 11
PAPER-COUNT 10 Bk 12
CARD-ARK 11 Br 13
+5V 12 Rd 14
+5V 13 Or 15
CARD-COUNTER-UMU 14 Bk 7
GND1 15 8
Key Card Counter III
CN4 14pins
GND1 1 Br 12
SORTER-UMU 2 Rd 13
TXD 3 Or 4
RXD 4 Y w 3
RTS 5 Gr 5
CTS 6 Bl 6
GND1 7 Vt 1
SETUZOKU 8 Gy 8
SET 9 Wh 9
P-SEN 10 Bk 10
RCV2 11 Br 7
+24V 12 Rd 14
GND2 13 Or 5
+5V 14 Y w 1
2
Sorter
CN4 10pins
GND1 1 Br
TAMAISUU-UMU 2 Rd
TAMAISUU-SETUZOKU 3 Or
CLEAR 4 Y w
RC-BUSY 5 Gr
ERROR-KAIJO 6 Bl
TAMAISUU-BUSY 7 Vt
TAMAISUU-ERROR 8 Gy
+24V 9 Wh
GND2 10 Bk
SF3000

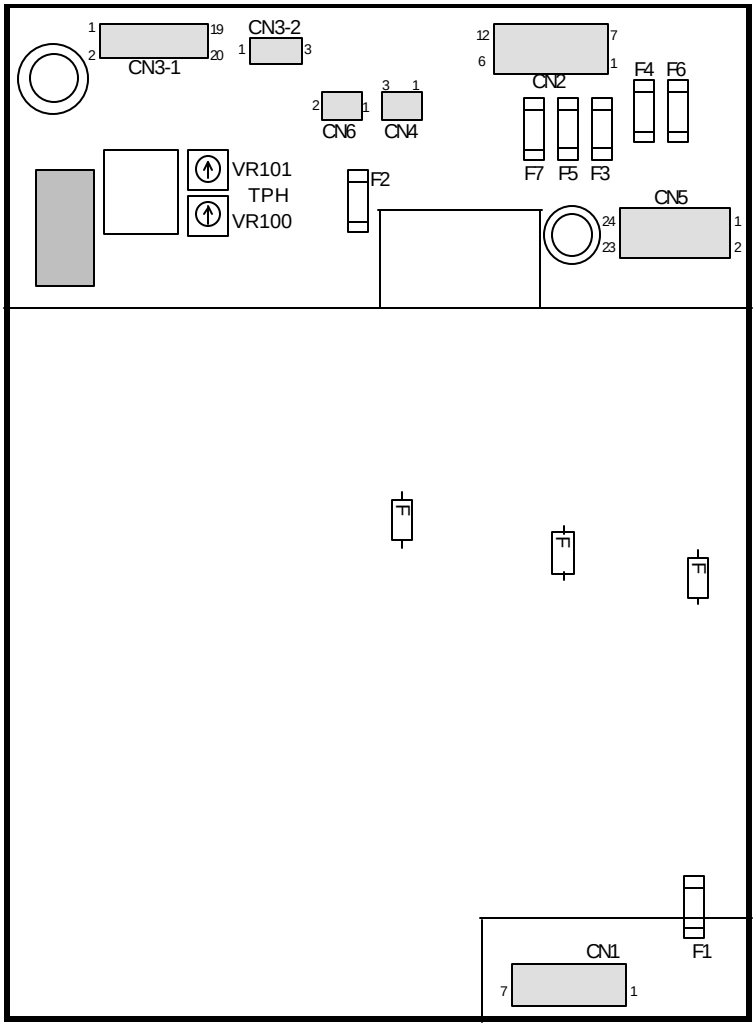
10.LCD Control PCB



LCD CONTROL PCB



11.Power Supply PCB 100-120V



CN

CN1 :
From AC Input
CN2 :
To PCB's
CN3-1 :
To TPH Sub PCB
To TPH Safety Switch
CN3-2 :
To Suction Fan Motor
CN4 :
Open
CN5 :
To PCB's
CN6 :
To Power Supply Fan Motor

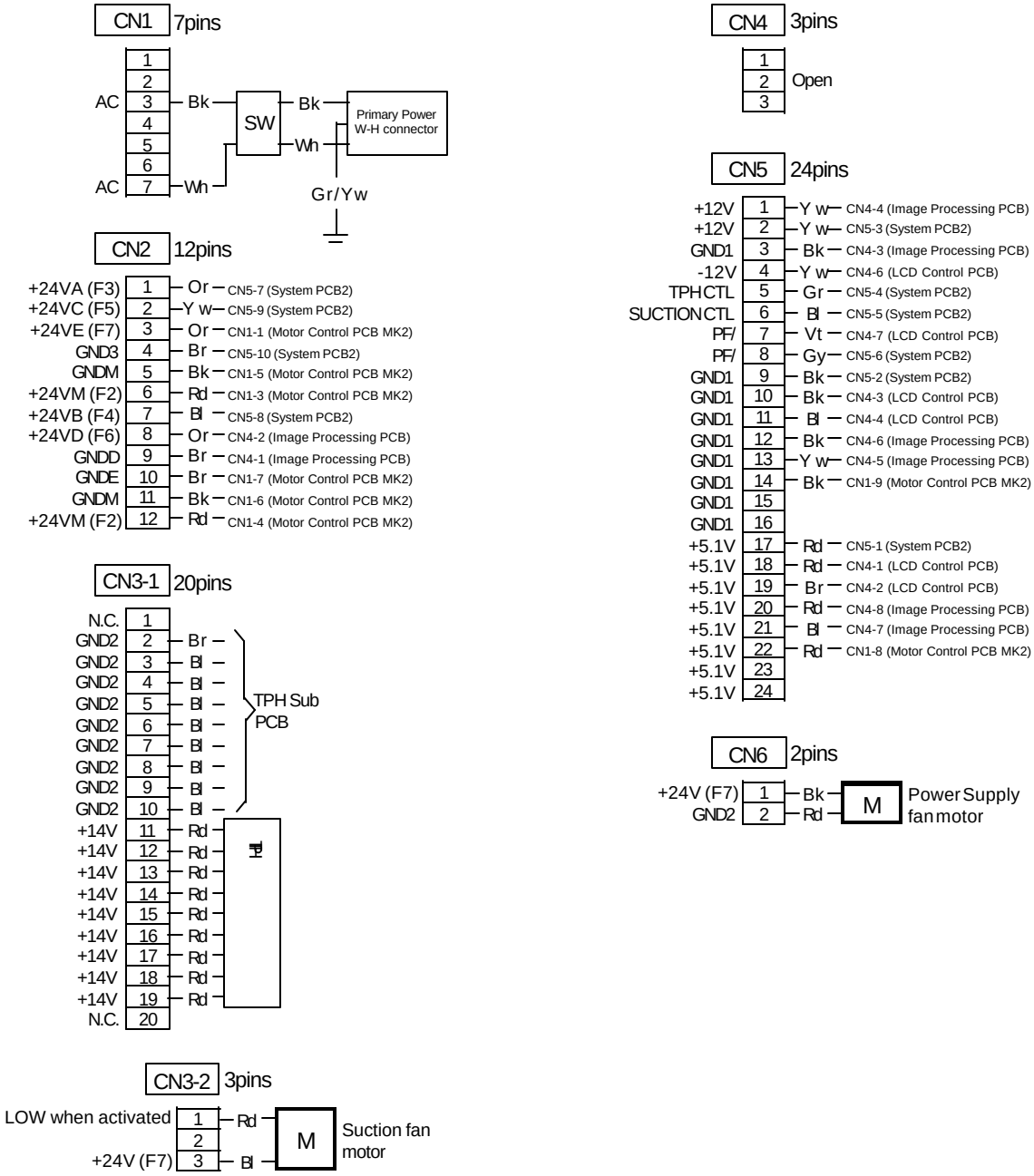
FUSE

F1 : 10A 125V
F2 : 8A 125V
F3 : 3.15A 125V
F4 : 3.15A 125V
F5 : 3.15A 125V
F6 : 3.15A 125V
F7 : 3.15A 125V
F40 : 3A 125V
F80 : 3A 125V
F90 : 3A 125V

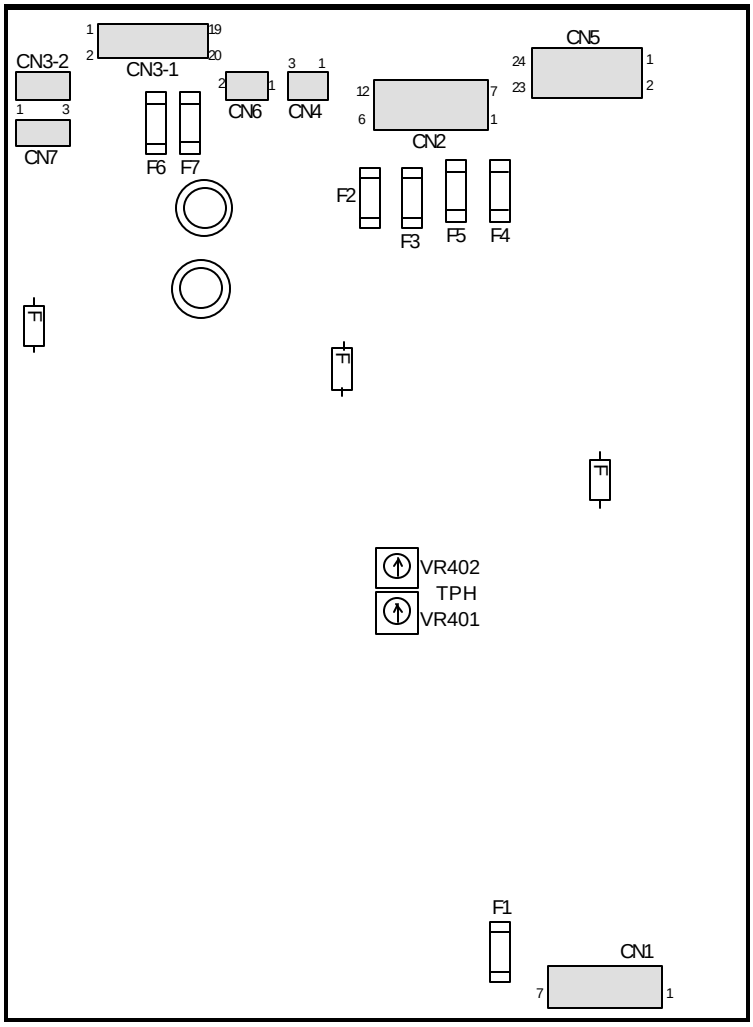
VR

VR100 : TPH voltage adjustment
(Normal adjustmet)

VR101 : TPH voltage adjustment
(Fine adjustment)


CN1 7pins
AC 3 Bk
SW
Bk
Wh
Primary Power W-H connector
AC 7 Wh
Gr/Yw
CN2 12pins
+24VA (F3) 1 Or CN5-7 (System PCB2)
+24VC (F5) 2 Y w CN5-9 (System PCB2)
+24VE (F7) 3 Or CN1-1 (Motor Control PCB MK2)
GND3 4 Br CN5-10 (System PCB2)
GNDM 5 Bk CN1-5 (Motor Control PCB MK2)
+24VM (F2) 6 Rd CN1-3 (Motor Control PCB MK2)
+24VB (F4) 7 Bl CN5-8 (System PCB2)
+24VD (F6) 8 Or CN4-2 (Image Processing PCB)
GNDD 9 Br CN4-1 (Image Processing PCB)
GNDE 10 Br CN1-7 (Motor Control PCB MK2)
GNDM 11 Bk CN1-6 (Motor Control PCB MK2)
+24VM (F2) 12 Rd CN1-4 (Motor Control PCB MK2)
CN3-1 20pins
N.C. 1
GND2 2 Br
GND2 3 Bl
GND2 4 Bl
GND2 5 Bl
GND2 6 Bl
GND2 7 Bl
GND2 8 Bl
GND2 9 Bl
GND2 10 Bl
TPH Sub PCB
+14V 11 Rd
+14V 12 Rd
+14V 13 Rd
+14V 14 Rd
+14V 15 Rd
+14V 16 Rd
+14V 17 Rd
+14V 18 Rd
+14V 19 Rd
N.C. 20
CN3-2 3pins
LOW when activated 1 Rd
2
+24V (F7) 3 Bl
M
Suction fan motor
CN4 3pins
1
2 Open
3
CN5 24pins
+12V 1 Y w CN4-4 (Image Processing PCB)
+12V 2 Y w CN5-3 (System PCB2)
GND1 3 Bk CN4-3 (Image Processing PCB)
-12V 4 Y w CN4-6 (LCD Control PCB)
TPH CTL 5 Gr CN5-4 (System PCB2)
SUCTION CTL 6 Bl CN5-5 (System PCB2)
PF/ 7 Vt CN4-7 (LCD Control PCB)
PF/ 8 Gy CN5-6 (System PCB2)
GND1 9 Bk CN5-2 (System PCB2)
GND1 10 Bk CN4-3 (LCD Control PCB)
GND1 11 Bl CN4-4 (LCD Control PCB)
GND1 12 Bk CN4-6 (Image Processing PCB)
GND1 13 Y w CN4-5 (Image Processing PCB)
GND1 14 Bk CN1-9 (Motor Control PCB MK2)
GND1 15
GND1 16
+5.1V 17 Rd CN5-1 (System PCB2)
+5.1V 18 Rd CN4-1 (LCD Control PCB)
+5.1V 19 Br CN4-2 (LCD Control PCB)
+5.1V 20 Rd CN4-8 (Image Processing PCB)
+5.1V 21 Bl CN4-7 (Image Processing PCB)
+5.1V 22 Rd CN1-8 (Motor Control PCB MK2)
+5.1V 23
+5.1V 24
CN6 2pins
+24V (F7) 1 Bk
GND2 2 Rd
M
Power Supply fan motor

12.Power Supply PCB 200-240V



CN

CN1 :
From AC Input
CN2 :
To PCB's
CN3-1 :
To TPH Sub PCB
To TPH Safety Switch
CN3-2 :
To Suction Fan Motor
CN4 :
Open
CN5 :
To PCB's
CN6 :
To Power Supply Fan Motor
CN7 :
Open

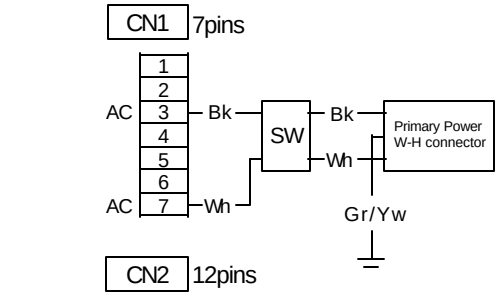
FUSE

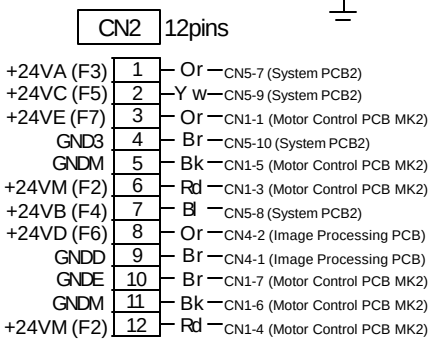
F1	: 5A 250V
F2	: 6.3A 250V
F3	: 3.15A 250V
F4	: 3.15A 250V
F5	: 3.15A 250V
F6	: 3.15A 250V
F7	: 3.15A 250V
F40	: 3.15A 125V
F80	: 3.15A 125V
F90	: 3.15A 125V

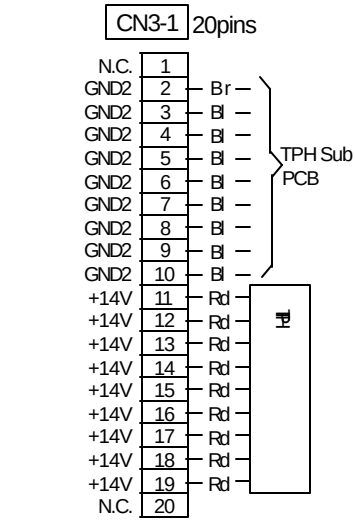
VR

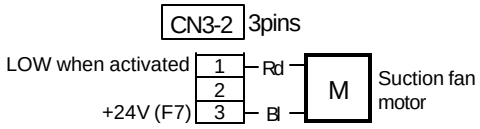
VR401 : TPH voltage adjustment
(Normal adjustmet)

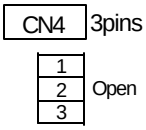
VR402 : TPH voltage adjustment
(Fine adjustment)

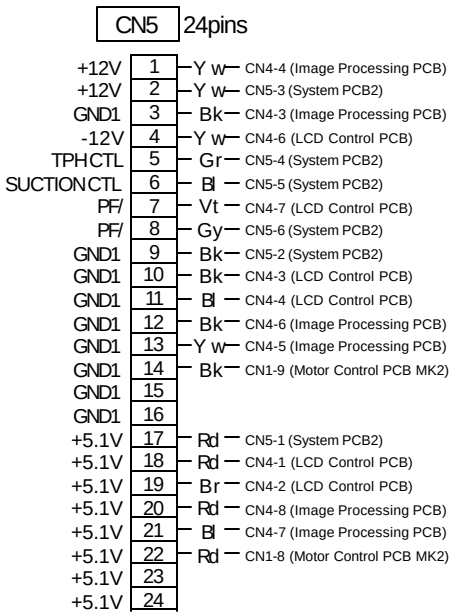

CN1 7pins
1
2
AC 3 Bk
4
5
6
AC 7 Wh
SW
Bk
Wh
Primary Power
W-H connector
Gr/Yw

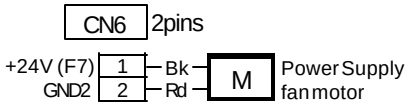

CN2 12pins
+24VA (F3) 1 Or CN5-7 (System PCB2)
+24VC (F5) 2 Yw CN5-9 (System PCB2)
+24VE (F7) 3 Or CN1-1 (Motor Control PCB MK2)
GND3 4 Br CN5-10 (System PCB2)
GNDM 5 Bk CN1-5 (Motor Control PCB MK2)
+24VM (F2) 6 Rd CN1-3 (Motor Control PCB MK2)
+24VB (F4) 7 Bl CN5-8 (System PCB2)
+24VD (F6) 8 Or CN4-2 (Image Processing PCB)
GNDD 9 Br CN4-1 (Image Processing PCB)
GNDE 10 Br CN1-7 (Motor Control PCB MK2)
GNDM 11 Bk CN1-6 (Motor Control PCB MK2)
+24VM (F2) 12 Rd CN1-4 (Motor Control PCB MK2)

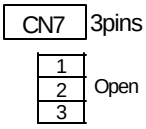

CN3-1 20pins
N.C. 1
GND2 2 Br
GND2 3 Bl
GND2 4 Bl
GND2 5 Bl
GND2 6 Bl
GND2 7 Bl
GND2 8 Bl
GND2 9 Bl
GND2 10 Bl
TPH Sub PCB
+14V 11 Rd
+14V 12 Rd
+14V 13 Rd
+14V 14 Rd
+14V 15 Rd
+14V 16 Rd
+14V 17 Rd
+14V 18 Rd
+14V 19 Rd
N.C. 20
TPH


CN3-2 3pins
LOW when activated 1 Rd
2
+24V (F7) 3 Bl
M
Suction fan motor


CN4 3pins
1
2 Open
3


CN5 24pins
+12V 1 Yw CN4-4 (Image Processing PCB)
+12V 2 Yw CN5-3 (System PCB2)
GND1 3 Bk CN4-3 (Image Processing PCB)
-12V 4 Yw CN4-6 (LCD Control PCB)
TPHCTL 5 Gr CN5-4 (System PCB2)
SUCTIONCTL 6 Bl CN5-5 (System PCB2)
PF/ 7 Vt CN4-7 (LCD Control PCB)
PF/ 8 Gy CN5-6 (System PCB2)
GND1 9 Bk CN5-2 (System PCB2)
GND1 10 Bk CN4-3 (LCD Control PCB)
GND1 11 Bl CN4-4 (LCD Control PCB)
GND1 12 Bk CN4-6 (Image Processing PCB)
GND1 13 Yw CN4-5 (Image Processing PCB)
GND1 14 Bk CN1-9 (Motor Control PCB MK2)
GND1 15
GND1 16
+5.1V 17 Rd CN5-1 (System PCB2)
+5.1V 18 Rd CN4-1 (LCD Control PCB)
+5.1V 19 Br CN4-2 (LCD Control PCB)
+5.1V 20 Rd CN4-8 (Image Processing PCB)
+5.1V 21 Bl CN4-7 (Image Processing PCB)
+5.1V 22 Rd CN1-8 (Motor Control PCB MK2)
+5.1V 23
+5.1V 24


CN6 2pins
+24V (F7) 1 Bk
GND2 2 Rd
M
Power Supply fan motor


CN7 3pins
1
2 Open
3

FUSE REPLACEMENT

CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATINGS OF FUSE(S).

Power Supply Model	100-120V Type	200-240V Type
F1	10A 125V	5A 250V
F2	8A 125V	3.15A 250V
F3	3.15A 125V	3.15A 250V
F4	3.15A 125V	3.15A 250V
F5	3.15A 125V	3.15A 250V
F6	3.15A 125V	3.15A 250V
F7	3.15A 125V	3.15A 250V
F40	3A 125V	3.15A 125V
F80	3A 125V	3.15A 125V
F90	3A 125V	3.15A 125V

13.TPH Sub PCB